

NATURAL HISTORY,
GENERAL AND PARTICULAR,
BY THE
COUNT DE BUFFON,

VOL. VII.

HISTORY OF QUADRUPEDS.

NATURAL HISTORY,
GENERAL AND PARTICULAR,
BY THE
COUNT DE BUFFON,

ILLUSTRATED WITH ABOVE SIX HUNDRED COPPER PLATES.

THE
HISTORY OF MAN AND QUADRUPEDS

TRANSLATED, WITH NOTES AND OBSERVATIONS,

BY WILLIAM SMELLIE,

MEMBER OF THE ANTIQUARIAN AND ROYAL SOCIETIES OF EDINBURGH.

A NEW EDITION,

CAREFULLY CORRECTED AND CONSIDERABLY ENLARGED, BY MANY
ADDITIONAL ARTICLES, NOTES, AND PLATES,

AND

SOME ACCOUNT OF THE LIFE OF M. DE BUFFON.

BY WILLIAM WOOD, F. L. S.

IN TWENTY VOLUMES.

VOL. VII.

LONDON:

PRINTED FOR T. CADELL AND W. DAVIES, STRAND;
F. C. AND J. RIVINGTON; WILKIE AND ROBINSON; F. WINGRAVE;
J. WALKER; SCATCHERD AND LETTERMAN; R. LEA; J. CUTHELL;
CLARKE AND SONS; LACKINGTON, ALLEN, AND CO.; C. LAW;
WHITE AND COCHRANE; LONGMAN, HURST, REES, ORME, AND
BROWN; JOHN RICHARDSON; J. M. RICHARDSON; J. BOOKER;
B. CROSBY AND CO.; E. JEFFERY; BLACK, PARRY, AND KINGSBURY;
J. HARDING; J. MAWMAN; J. BOOTH; J. ASPERNE; J. HARRIS; P. AND
W. WYNNE; R. SCHOLEY; R. BALDWIN; J. BLACKLOCK; T. HAMILTON;
J. FAULDER; SHERWOOD, NEELEY, AND JONES; J. JOHNSON AND CO.;
T. UNDERWOOD; A. SAUNDERS; AND WILSON AND SON, AT YORK.

1812.

CONTENTS.

	PAGE.
<i>Natural History of the Great Ant-Eater, the</i>	
<i>Middle Ant-Eater, and the</i>	
<i>Least Ant-Eater</i>	1
<i>the Cape Ant-Eater</i>	24
<i>the Short-tailed and the</i>	
<i>Long-tailed Manis</i>	30
<i>the Armadillo</i>	37
<i>the Three-banded Armadillo</i>	43
<i>the Six-banded Armadillo</i>	47
<i>the Eight-banded Armadillo</i>	52
<i>the Nine-banded Armadillo</i>	54
<i>the Twelve-banded Arma-</i>	
<i>dillo</i>	58
<i>the Eighteen-banded Arma-</i>	
<i>dillo</i>	62
<i>the Long-tailed Armadillo</i>	73
<i>the Paca, or Spotted Cavy</i>	74
<i>the Virginian Opossum</i>	86
<i>the Murine Opossum</i>	115
<i>the Mexican Opossum</i>	119
<i>the Crab-Eater</i>	122
<i>the Phalanger, or Surinam</i>	
<i>Opossum</i>	127
<i>the Merian Opossum</i>	130
<i>the Elephant</i>	133
<i>On the Fossil Remains of Elephants, &c. By the</i>	
<i>Editor</i>	227
<i>Natural History of the Rhinoceros</i>	244
<i>the Camel and Dromedary</i>	271
<i>the Buffalo, the Bonasus, the</i>	
<i>Urus, the Bison, and the</i>	
<i>Zebu</i>	304
<i>the Mouflon and other Sheep</i>	358

	PAGE.
<i>Natural History of the Axis</i>	384
<i>the Zebu, or Dwarf Ox</i>	394
<i>the Tapir</i>	397
<i>the Zebra</i>	410
<i>the Czigithai</i>	423
<i>the Koulan</i>	428
<i>the Qwagga</i>	430
<i>the Hippopotamus</i>	435

ERRATUM.

Page 305, note, for "ursus" read urta.

DIRECTIONS TO THE BINDER.

		<i>To face Page</i>
Plate	CXCIV. Great Ant-Eater	1
	CXCV. Middle Ditto	3
	CXCVI. Least Ditto	4
	CXCVII. Cape Ditto	24
	CXCVIII. Short-tailed Manis	30
	CXCIX. Long-tailed Ditto	32
	CC. Six-banded Armadillo	47
	CCI. Nine-banded Ditto	54
	CCII. Twelve-banded Ditto	58
	CCIII. Ditto Ditto	<i>ibid.</i>
	CCIV. Long-tailed Ditto	73
	CCV. Paca	74
	CCVI. Virginian Opossum	86
	CCVII. Ditto Female	<i>ibid.</i>
	CCVIII. Murine Opossum	115
	CCIX. Ditto Female	<i>ibid.</i>
	CCX. Mexican Opossum	119
	CCXI. Crab-Eater	122
	CCXII. Phalanger	127
	CCXIII. Ditto Female	<i>ibid.</i>
	CCXIV. Elephant	133
	CCXV. Skull of the Indian Elephant	234
	CCXVI. Ditto of the African Elephant	<i>ibid.</i>
	CCXVII. Teeth of the Indian and African Elephant	236
	CCXVIII. Skeleton of the Mastodonte	242
	CCXIX. Ditto of the Elephant	<i>ibid.</i>
	CCXX. Rhinoceros	244
	CCXXI. Two-horned Rhinoceros	268
	CCXXII. Camel	271
	CCXXIII. Dromedary	272
	CCXXIV. Buffalo	304
	CCXXV. Bison	342
	CCXXVI. Mouflon	358
	CCXXVII. Iceland Ram	<i>ibid.</i>
	CCXXVIII. Ditto Ewe	<i>ibid.</i>
	CCXXIX. Barbary Wedder. . . .	<i>ibid.</i>

		<i>To face</i>
Plate		<i>Page</i>
CCXXX.	Indian Ram	358
CCXXXI.	Ditto	<i>ibid.</i>
CCXXXII.	Ditto Ewe	<i>ibid.</i>
CCXXXIII.	Ram of Tunis	<i>ibid.</i>
CCXXXIV.	Morvant	<i>ibid.</i>
CCXXXV.	Axis	384
CCXXXVI.	Ditto Female	<i>ibid.</i>
CCXXXVII.	Zebu	394
CCXXXVIII.	Tapir	397
CCXXXIX.	Zebra	410
CCXL.	Ditto	<i>ibid.</i>
CCXLI.	Qwagga	430
CCXLII.	Hippopotamus	435
CCXLIII.	Ditto Male	472
CCXLIV.	Ditto Female	<i>ibid.</i>



GREAT ANTEATER

NATURAL HISTORY.

THE GREAT ANT-EATER*, THE MIDDLE ANT-EATER†, AND THE LEAST ANT-EATER‡.

IN South America, there are three animals, with a long muzzle, a narrow mouth, without any teeth, and a long round tongue, that they

Dentes nulli.

Lingua teres, extensilis.

Os angustatum in rostrum.

Corpus pilis nudum.

THE GREAT ANT-EATER SEE PAGE 111.

MYRMECOPHAGA JUBATA. *M. palmis tetradactylis, plantis pentadactylis, cauda jubata.* — *Linn. Syst. Nat. Gmel. i. p. 52.*
— *Erxleb. Mamm. p. 93.* — *Schreb. il. p. 203, pl. 67.*

Myrmecophaga rostro longissimo, pedibus anticis tetradactylis, posticis pentadactylis. cauda longissima nilis vestita.
— *Briss. Quadr. p.*

VOL. VII.

thrust into the ant nests, and retract it when covered with these insects, which constitute their principal food. The first of these ant-eaters is

TAMANDUA-GUACU. — *Marcgr. Bras.* 225. — *Ray's Quadr.* p. 241. — *Klein, Quadr.* p. 45, t. 4, fig. bona.

MYRMECOPHAGA SCIUREA. — *Pall. Miscell.* p. 65.

LE TAMANOIR. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 209, pl. 16, fig. 1.

GREAT ANT-EATER. — *Penn. Hist. Quadr.* ii. p. 256. — *Shaw's Gen. Zool.* i. p. 167, pl. 49. — *Mus. Lever.* i. p. 99, pl. 12.

HABITAT

in America australi, et Africæ regno Congo.

W.

The great ant-eater has a long slender nose, small black eyes, short round ears, a slender tongue, two feet and a half long, which lies double in the mouth; slender legs, four toes on the fore-feet and five on the hind. The two middle claws on the fore-feet are very large, strong, and hooked. The hair on the upper part of the body is half a foot long, black mixed with gray. From the neck cross the shoulders to the sides, there is a black line bounded above with white. The fore-legs are whitish, marked above with a black spot. The tail is clothed with very coarse black hairs, a foot long. The length, from nose to tail, is about three feet ten inches, and that of the tail is two feet and a half. — *Penn. Synops. Quadr.* p. 331.

† CHARACTER SPECIFICUS.

MYRMECOPHAGA TETRADACTYLA. *M. palmis tetradactylis, plantis pentadactylis, cauda calva.* — *Less. Syst. Nat. Gmel.* i. p. 53. — *Erxleb. Mamm.* p. 95. — *Schreb.* ii. p. 205, pl. 76.

Myrmecophaga rostre longissimo, pedibus anticis tetradactylis, posticis pentadactylis, cauda fere nuda. — *Bris. Quadr.* p. 26.

MYRMECOPHAGA MYOSURA. — *Pall. Miscell.* p. 64.



W. Bell & Co. del.

MIDDLE ANT EATER

called by the Brasilians *tamenduguacu*, or great *tamandua*, to which the French inhabitants of America have given the name of *tamanoir*.

Tamandua-i Brasiliensibus. — *Ray's Quadr.* p. 242. — *Martgr. Bras.* p. 225, fig. p. 226, bona.

LE TAMANDUA. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 209, pl. 16, fig. 2.

MIDDLE ANT-EATER. — *Penn. Hist. Quadr.* ii. p. 258. — *Shaw's Gen. Zool.* i. p. 169, pl. 50.

HABITAT

in America meridionali, victu et moribus jubata. Cauda se ex arborum ramis suspendit. W.

The middle ant-eater has a long slender nose, bending a little down, small black mouth and eyes, and small upright ears. The bottoms of the fore-feet are round, with four claws on each, and five on the hind-feet. The hair is shining, hard, and of a pale yellow colour; along the middle of the back, and on the hind-legs, it is dusky. On each side of the neck, there is a black line, which crosses the shoulders, and meets at the end of the back. The tail is covered with longer hair than the back, is taper, and bald at the end. The length, from nose to tail, is one foot seven inches; and that of the tail, ten inches. — *Penn. Synops. Quadr.* p. 332.

‡ CHARACTER SPECIFICUS.

MYRMECOPHAGA DIDACTYLA. *M. palmis didactylis, plantis tetradactylis, cauda villosa.* — *Linn. Syst. Nat. Gmel.* i. p. 52. — *Ferreb. Mann.* p. 90.

Myrmecophaga rostro brevi, pedibus anticis didactylis, posticis tetradactylis. — *Bris. Synops.* p. 98.

Tamandua seu casti Americanae forma altera. — *Sch. Mus.* i. p. 60, t. 37, fig. 3, bona.

LE FOURMILLIER. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 209, pl. 16, fig. 3.

From the end of the muzzle to the origin of the tail, it is about four feet in length. The head is from fourteen to fifteen inches long, and the tail about two feet and a half, covered with coarse hair more than a foot in length. The muzzle is immoderately long, the neck short, the head narrow, the eyes small and black, the ears roundish, the tongue thin, more than two feet long, and, when retracted, it folds up in the mouth. The legs exceed not a foot in length, those before being a little longer and thinner than those behind. The feet are round. The fore-feet have four claws; and the two middlemost are largest. Those behind have five claws. The colour of the hairs, both on the body and tail, is a mixture of black and white. The hair on the tail is disposed in the form of a plume, which the animal, when he wants to

LITTLE ANT-EATER. — *Shaw's Gen. Zool.* i. p. 172, pl. 52,
— *Edward's A.* t. 220.

LARGE ANT-EATER. — *Penn. Mus. Quadr.* i. p. 260, pl. 95.

in America australi.

W.

The large ant-eater has a conic nose, bending a little down; small ears, hid in the fur; two hooked claws on the fore-feet, the exterior much the largest, and four on the hind-feet. The head, body, limbs, and upper part of the sides of the tail are covered with long, soft, silky hair, or rather wool, of a yellowish brown colour. The length, from nose to tail, is seven inches and a half, and that of the tail eight and a half, the last four inches of which, on the under side, are naked. The tail is thick at the base, and tapers to a point.
— *Penn. Synops. Quadr.* p. 333.



LEAST ANT-EATER

sleep, or to defend himself from rains or the heat of the sun, turns on his back, and it covers his whole body. The long hairs of the tail and body are not round through their whole extent, but flat at the extremities, and feel dry to the touch, like withered herbs. When irritated, he gives a brisk agitation to his tail; but, when walking at ease, he allows it to trail and sweep the ground over which he passes. The hairs on the anterior parts of his body are shorter than those on the posterior: the latter are turned backward, and the former forward. The anterior parts are also whiter than the posterior. There is a black stripe upon the breast, which stretches along the sides, and terminates on the back near the thighs. The hind-legs are nearly black, and those before almost white, with a large black spot about the middle. The great ant-eater runs so slow, that a man can easily overtake him in the chase. His feet seem less fitted for running than for climbing, and seizing cylindrical bodies, for he takes such a forcible hold of a branch or a stick, that it is impossible to make him quit it.

Dr. Maudslowi, a learned naturalist and physician, has sent us from Guiana a well preserved specimen of the great ant-eater, which, though precisely the same species with that just described, has a shorter muzzle. The distance between the eye and the ear is likewise less, and the feet are shorter. On the fore-feet there are four claws; the two middlemost being very large, and the two outermost very small. The hind-feet have five black claws. The muzzle, as far as the ears, is covered with short brown hair. About

- the ears, the hair begins to grow longer; upon the sides of the body, it is two inches and a half in length, and as hard to the touch as that of the wild boar. The colour of the hair is a mixture of deep brown and a dirty white. This animal is three feet eleven inches long.

M. de la Borde, king's physician at Cayenne, has communicated the following observations regarding this animal :

“ The ant-eater inhabits the woods of Guiana, where there are two species. The individuals of the largest kind sometimes weigh one hundred pounds. They run more slowly and sluggishly than the hog. They swim across large rivers; and, on these occasions, it is easy to knock them down with a stick. In the woods, they are shot with muskets. They are not very common; and the dogs refuse to hunt them.

“ The great ant-eater tears up with his claws the nests of the wood-lice, that are every where to be found on the trees, which he climbs with ease. It is dangerous to come near this animal; for his claws inflict the most dreadful wounds. He defends himself with success against the most ferocious animals of this continent, as the jaguars, cougars, &c., whom he tears with his claws, the muscles and tendons of which are very strong. He kills many dogs; and therefore they refuse to hunt him.

“ The great ant-eater is often seen in the large uncultivated savannahs. He is said to feed upon ants. In his stomach, which is larger than that of a man, I found a vast number of wood-lice, that had been recently swallowed. The struc-

ture and dimensions of his tongue seem to indicate that he may likewise feed upon ants. The female brings forth but one young, in holes of trees, near the root; and, at this period, she is dangerous even to men. The flesh of this animal is eaten by the common people of Cayenne; it is black, and has neither fat nor flavour. His skin is thick and hard; and his tongue is nearly of the same conical form with his muzzle."

"The great ant-eater," continues M. de la Borde, "acquires not his full growth in less than four years. His respiration is performed solely by the nostrils. At the first vertebra which joins the neck to the head, the wind-pipe is very large; but it suddenly contracts, and forms a canal, which is continued, in the horn or trunk that serves the animal for an upper jaw, to the nostrils. This horn is a foot in length, being as long, at least, as the rest of the head. The wind-pipe has no opening into the mouth; and yet the aperture of the nostrils is so small, as hardly to admit a common quill. The eyes are very small, and the animal sees at a side only. His fat is extremely white. When he crosses rivers, he carries his long tail on his back.

Messrs. Aublet and Olivier assure me, that the great ant-eater feeds by means of his tongue only, which is covered with a viscid humour, to which the insects adhere. They add, that his flesh is not bad*.

* "Before I leave the woods," says Stedman, "I must describe another creature which inhabits them and which lives chiefly on ants; this is the great ant-eater, or ant-bear,

The second of these animals, or the middle ant-eater, is called simply *tamandua* by the Americans. He is much smaller than the former,

called also the tamanoir, and by the Spaniards the *osa palmera*. The body of this animal is covered over with very long shaggy hair; on the back and belly it is white, and on the neck and sides a gray, or yellowish white; the head is extremely long and slender, of a light bay colour, with very small eyes; the ears are short and round, and the mouth (which has no teeth) just large enough to admit its tongue; the tail is of an enormous size, with very long black hair, something like that of a horse: with this extraordinary tail, when asleep (which is generally in the day-time, or during a hard shower of rain), the animal covers itself like a squirrel; at other times he trails it along, and sweeps the ground. The limbs are slender, but covered with long hair; the hindmost legs being shortest and black, with five claws; those before are of a dirty white, with but four claws, the two middle claws being of an extraordinary length.—The great ant-eater is a very bad walker, resting always on the heels of his awkward long feet, like the coati and bear; but he is a better climber, and so good a fighter, that no dog will hunt him, since whatever animal he catches between his fore-claws (may even the jaguar or tiger), he will not release while he has life. His food, as I have said, consists of ants, which he takes in the following manner: When he comes to an ant-hill, he unfolds his slender tongue, which is about twenty inches long, most exactly resembling a worm; this being covered over with a clammy matter or saliva, the ants get upon it in great numbers, and, by drawing it into his mouth, he swallows thousands all alive, and renews the operation till no more are to be found, when he marches in quest of another mountain, and in the same manner destroys the unwary inhabitants. He also climbs in quest of wood-lice and wild honey; but should he meet with little success in his devastations, he is able to fast a considerable time without the smallest inconvenience. It is said that the great ant-bear is tameable, and that then he will pick crumbs of bread, and small pieces of

being only about eighteen inches from the extremity of the muzzle to the origin of the tail. His head is six inches in length. His muzzle is long, and crooked downward. The tail is ten inches long, and naked at the point. The ears are erect, and an inch in length. The tongue is round, eight inches long, and placed in a kind of groove or canal within the lower jaw. The height of the legs exceeds four inches; and they are of the same form, and furnished with the same number of claws, as the great ant-eater. He climbs, and adheres firmly to the branches, like the former species, and runs or walks equally ill. Neither can he shelter himself with his tail; because it is too short, and part of it is bare. When he sleeps, he conceals his head under his neck and fore-legs.

The animal we have represented, the skin of which is well preserved in the royal cabinet, belongs to the species of *tamandua*, or middle ant-eater. It differs from the *tamanoir*, or great ant-eater, not only in size; but in figure. Its head is proportionally much thicker. The eye is so small that it exceeds not a line in breadth. The ears are round, and fringed above with large black hairs. The body, from the tip of the nose to the origin of the tail, is thirteen inches long, and ten inches high. The hair on the top of

flesh; also that, when killed, he affords good food to the Indians and Negroes, the last of which I have seen devour his flesh with pleasure. Some ant-bears measure, from the snout to the tip of the tail, no less than eight feet." --- *Stedman's Surinam*, vol. ii. p. 328. W.

the back is fifteen lines long, and that on the belly, which is of a dirty white colour, is of an equal length. The tail, which is only seven inches and a half long, is wholly covered with long yellow hair, and variegated with bands or rings slightly tinged with black.

In all this description, there are only two characters which accord not with that given of the tamandua by Marcgrave. 1. The tail is all garnished with hair; but that of Marcgrave was naked at the extremity. 2. In our tamandua, there are five toes on the fore-feet; in that of Marcgrave there were only four. But, as they agree in every other article, we must conclude the animal, whose figure is here represented, to be a variety of the tamandua, or middle ant-eater, if not precisely the same species.

M. de la Borde seems to point out this animal under the name of the *little tamanoir*.

"It has," says he, "whitish hair, about two inches long, and weighs above sixty pounds. It has no teeth; but its claws are very long. Like the former, it feeds during the night, and the female brings forth but one at a time. Its manners are also the same; and it frequents the large forests. Its flesh is very good; but it is more rarely to be met with than the great tamanoir."

I wish M. de la Borde had given a more particular account of this animal, that all uncertainty with regard to its species might have been removed.

The third species is called by the natives of

Guiana *oualirouaou*. To distinguish it from the two former, we have given it the appellation of the *least ant-eater*. It is much smaller than the middle kind; for it exceeds not six or seven inches from the extremity of the muzzle to the origin of the tail; the head is two inches long, and the muzzle is proportionally shorter than that of the middle ant-eater. The tail, which is seven inches in length, curls downward at the extremity, where it is naked. The tongue is narrow; a little compressed, and very long. It has almost no neck. The head is thick in proportion to the body. The eyes are placed low, at no great distance from the corners of the mouth. The ears are small, and concealed by the hair. The fore-legs are only three inches long, and their feet have but two claws, the outmost of which is much thicker and longer than the inmost. There are four claws on the hind-feet. The hair on the body is about nine inches long, soft, and of a brilliant colour, being a mixture of red, with a bright yellow. The feet are not fitted for walking, but for climbing, and laying hold of objects. The animal mounts upon trees, and suspends himself on the branches by the extremity of his tail.

With regard to this animal, M. de la Borde, at the same time, sent me the following remarks;

“ It has bright reddish hair, and somewhat of a golden colour. It feeds upon ants, which adhere to its long worm-shaped tongue. This animal is not larger than a squirrel. It moves slowly, and is easily taken. Like the sloth, it fixes itself

to a staff; and, as it has no desire to disengage itself, it may be carried in this manner wherever we please. It has no cry. We often find these animals adhering to branches by their claws. The females bring forth only one at a time in holes of trees, which they line with leaves. They feed in the night only. Their claws are very dangerous; and they clasp them so close, that it is impossible to loose them. They are not rare; but it is difficult to perceive them on the trees *."

Of this genus, we know only the three species above described. M. Brisson mentions, from Seba, a fourth species, under the name of the *long eared ant-eater*. But this species seems to be extremely suspicious; for, in Seba's enumeration of the ant-eaters, he says expressly, "We have, in our cabinet, *six species* of ant-eaters." He describes, however, only five; and among these five he places the *ysquiepatl*, or stifling weasel, an animal not only of a different species, but of a genus very remote from that of the ant-eaters; since it has teeth †, a flat short tongue,

* Daubenton observes that the stomach of this animal is of a very singular figure: he also says that the last portion of the intestinal canal is provided with two appendices, capable of inflation, in which he found the remains of ants like those which filled the intestines. The presence of these appendices form a character peculiar to this animal, and perhaps to the other species of this genus. W.

† Vapulavit aliquando optimus autor de nominibus propriis, si ysquiepatl seu vulpeculam Mexicanam, tamanduum dixit; p. 66. Quasi aliquam omnino speciem, canis septentrionalis fere æmulam, maxilla inferiore crassa et rotunda, binis insignibus dentibus armata, cum tamen de sex diversis speciebus sit professus, quod omnes dentibus careant.—*Klein. de Quadr.* p. 43.

like that of other quadrupeds,* and approaches very near to the weasel kind. Of these six species, pretended to be preserved in the cabinet of Seba, there remain only four; for the ysquiepatl, which is the fifth, is by no means an ant eater, and he makes no mention of the sixth, unless the author intended to rank the scaly lizard under this genus, which appears not from his descriptions. The scaly lizard feeds upon ants; he has a long muzzle, a narrow mouth, without any apparent teeth, and a long, round tongue. These characters are common to the scaly lizard and ant-eaters. But the former differs from all other quadrupeds by the singularity of having its body covered with large scales instead of hair. Besides, it is an animal peculiar to the warm climates of the Old Continent; while the ant-eaters, whose bodies are covered with hair, are found only in the southern regions of the New World. There remains, therefore, but four species, instead of six announced by Seba; and, of these four, only one is recognisable from his descriptions, which is our third or least ant-eater, to whom Seba has given but one claw to each fore-foot*, instead of two. The other three are

* Fig. 3. *Tamandua*, or another white American coati. This animal is totally different from the preceding (he means that of table 37, fig. 2. See the following note). The head is much shorter, and the ears much smaller. The eyes are a little larger, and the inferior part of the muzzle somewhat longer. Their tongues are more similar, both of them being fitted for swallowing ants. The shoulders are large, the body thick and short, and the fore-feet are armed with one large hooked claw. The hind-legs and feet resemble those of an ape. Its white woolly hair is shorter than that of the preceding;

so ill described, that it is impossible to distinguish their true species. I thought it proper to transcribe these descriptions entire, not only to prove what I have advanced, but to give an idea of what credit is due to this writer. The animal he calls *tamandua murmecophage d'Amerique*, tom. i. p. 60, tab. 37, fig. 2, has no relation to any of the three of which we are here treating. To be convinced of this fact, we have only to read the author's description *. The second, which

and the same may be said of its crisped tail. This animal is reckoned the rarest of its species. The Negroes of Surinam called it *coati*, and relate that, when apprehended, it rolls itself up, with the feet so closely attached to each other, that it is impossible to force them asunder. It dies in a moment, when immersed in spirit of wine or in the liquor *kilduivel*. — *Seba*, vol. i. p. 60, plate 37, fig. 3.

* *Tamandua murmecophage d'Amerique*. This animal is very common in the West Indies; but the only one we have seen was brought from the East Indies. Several naturalists have entertained marvellous ideas concerning this creature. Some imagined it to be the *leo formicarius*, others the *formica leo*, the *formica vulpes*, the *formica lupus*, &c. M. Poupert in the *Mem. des l'Acad. Royale des Sciences*, ann. 1704, p. 235, remarks that this animal was gray, and made snares like a spider, for entangling ants; but this comparison seems not to be just. Bastamantanus, who has written a book upon the reptiles mentioned in the Bible, regards the *murmeco leo*, another name for this animal, as a species of beetle called the *horned beetle*, and which is denominated the *flying stag* by the Germans. (*All this we perceive, is very important and very useful in the description of a quadruped*). But, continues the author, all these descriptions, and several others, express not the nature of this animal, the figure of which we have given from the original. It is covered with soft woolly hair, has a short neck, broad shoulders, a long narrow head and muzzle, from which issues a long tongue, adapted for seizing and swallowing ants. The wisdom of the Creator has

he mentions under the name of the *tamandua-guaou* of Brasil, or the bear which eats the ants *,

furnished these animals with the necessary organs for collecting food agreeable to their taste. The fore-paws have each, *beside the ordinary toes, three other toes*, which have grown above the others, and are armed with hooked claws, the largest of which is on the middle toe. It is with these that they scrape the earth, and pierce the ants' nests. The nostrils, which are placed very near the mouth, are straight, rough, and furnished with hair. They discover the retreats of the ants by the scent. The ears are oblong, or pendulous. The hind-feet, as in the bear, are divided into five toes, armed with long crooked claws. The tail, which is long and bushy, terminates in a point, and they use it, like the monkeys, in fixing themselves to the branches of trees. The testes of the males are concealed within the skin. The ants, both large and small, become a prey to these animals, which, in their turn, are used by men as a medicine. — *Seba*, vol. i. p. 60, tab. 37, fig. 2. From such a description nothing can be learned: to apply it to the ant-eaters, as Linnaeus has done, to give, at the same time, this animal three toes on the fore feet, besides the ordinary three, and to make these grow above the others, are absurdities so glaring, as to throw discredit upon the whole narration.

* *Tamandua-guaou*, of Brasil, or the bear that eats the ants. This is the largest species we have ever seen. *Marcgrave* calls it *tamandua guacu*, and *Cardan*, *ursus formicarius*, or the bear that eats the ants. The body is long; the shoulders are broad and high; the head is very long; the muzzle gradually tapers to a point; and the nostrils are large and open: the tongue, which it thrusts out to seize the ants, *about the eighth part of a cubit*, terminates in a round button. The ears are long and pendulous. The eyes are pretty large, and defended by thick hairs. The muzzle is long, wrinkled, and garnished with hair. The rest of the body is covered with long, thick hairs, similar to hogs' bristles, but become fine and woolly near the skin, and their colour is a bright chestnut. The hair on the belly is of a deeper brown. Under the tail, which is long, and terminates in a point, the colour of the

page 65, tab. 40, fig. 1. This is vague and equivocal language. I agree, however, with

hair is a bright yellow. The female, whose figure we have given, has eight paps, three on each side of the belly, and two between the fore-feet. Witnesses worthy of credit relate, that the females bring forth at every litter, as many young as they have paps, in which they resemble the swine, *who never bring forth many at a time, unless they have a great number of paps.* Both the fore and hind-feet are larger than those described in fig. 2, of the preceding table. They use for food the largest kinds of ants.

We have in our cabinet *six species of ant-eaters*, who all differ from each other in the figure of the body, head, feet, and claws. The tamandua represented in fig. 2 (Note, *He is here speaking of the ysquiepatl, which differs more from the tamandua than a cat from a dog*) is a fourth part less than the former, its head, ears, and eyes, are also smaller. His fore-foot has only a single claw, which is strong and hooked. The hind-foot has three toes and three claws. The hair is soft, woolly, and coloured like that of a young hare. The figure of the fifth species of tamandua is the same. The colour of the hair is a pale red on the back, mixed with a silvery white, and a yellowish ash-colour on the belly. This species has four paps, two under the fore and two under the hind-legs. (*This species, being of the same figure with that which precedes it, must, therefore, be a species of ysquiepatl, and not of the tamandua.*) The sixth species has a long muzzle and ears erect like those of the fox. None of these species have teeth. — *Seba*, vol. i. p. 65, tab. 40, fig. 1. It is impossible to comprehend what the author says, or what he means by the sixth species. We only perceive that he clearly contradicts himself, when he tells us, that none of these species have teeth, since the *ysquiepatl*, which is *nominatim* included among the six, has a great number of teeth. From such examples, we may form a judgment of this author and his work. It is a subject of regret, that men who make cabinets of natural objects, are not better informed, and that, to gratify their insignificant vanity, and enhance the value of their collections, they undertake the publication of descrip-

Klein* and Linnæus, that it may be the true tamanduaguaca, or great ant-eater; but so miserably described and represented, that Linnæus† has united under one species Seba's first and second animals, namely, that of tab. 37, fig. 2, and that of tab. 40, fig. 1. M. Brisson has considered the last as a distinct species; but I know not whether the establishing of this species be better founded, than the reproach he throws upon M. Klein for confounding it with that of the great ant-eater. The only reproach which M. Klein seems to merit is for adding, to a good description that he has given of this animal, the false remarks of Seba. In fine, the third of these animals, of which we find a figure in Seba, tom. ii. p. 48, tab. 47, fig. 2, is so ill described, that, notwithstanding my confidence in the judgment of M. Linnæus and Klein, this animal, from Seba's figure and description, can never be referred to the *tamandua-i*, or middle ant-eater. I would beg of them to peruse the description ‡ a second

tions, which are always replete with such numerous exaggerations and blunders, that the correction of them would require more time than the authors bestow on the composition of their voluminous works.

* Klein de Quadrup. p. 45.

† Linn. Syst. Nat. p. 51.

‡ *The little American tamandua, or the ant-eater delineated along with a nest of these insects.* See how it embraces with its fore-claws the nest of ants, upon which alone it feeds. Observe its oblong, thin, narrow head, its short ears, its pointed muzzle, that conceals its long slender tongue, with which it catches and swallows the ants, as I propose to show in the following plates (*no such plates appear in his work*). The

time, and then form their judgment. Discussions of this kind are always disagreeable; but they often cannot be avoided in details of natural history. Before describing an object, we must clear it, as far as possible, from all obscurities, and mark the numberless errors that obstruct the road to truth, at which it is often difficult to arrive.

From this critical examination, one thing appears to be certain, that three species of ant-eaters actually exist, that these three are the great, the middle, and the least ant-eater, or the *tamanoir*, the *tamandua*, and the *fourmillier*; and that the fourth species, mentioned by M. Brisson under the name of the *long-eared ant-eater*, is very doubtful, as well as the other species described by Seba. We have seen the great and the least ant-eater; their skins are in the Royal Cabinet, and they are very distinct species. But we have never seen the middle kind. Our description of it shall be taken from Piso and Marcgrave, the only authors who ought to be consulted concerning this animal, because all others have copied from them.

As to size of body, the *tamandua*, or middle ant-eater, may be considered as a mean propor-

head, legs, feet, tail, and the fore part of the body, are straw-coloured. The hind part of the body is reddish brown. Upon the breast there is a belt of silky hair, which gradually disappears about the middle of the back. The tail is short, almost naked, and curled inward.—*Seba*, vol. ii. p. 48, tab. 47, fig. 2. *Note*, The last characters in this description agree pretty well with the *tamandua*; but, in general, it is so incorrect, that it determines nothing.

tional between the great and the least kind. Like the great ant-eater, he has a long muzzle, and four toes on the fore-feet; but, like the least kind, his tail, by which he hangs on the branches of trees, is naked at the extremity. Both kinds, when suspended on a branch, balance their bodies, stretch their muzzles towards the hollows they discover in trees, thrust in their long tongues, and quickly retract them, in order to swallow the insects they have collected.

These three animals, which are so different in size and proportions of body, have many common qualities, both in their structure and manners. They all feed upon ants, and plunge their tongues into honey, and other liquid or viscid substances. They readily pick up crumbs of bread, or small morsels of flesh. They are easily tamed. They can subsist a long time without any food. They never swallow all the liquor which they take for drink; for a part of it falls back through the nostrils. They generally sleep during the day, and move about in the night. They run so slowly, that a man may easily overtake them in an open field. Their flesh, though its taste be very disagreeable, is eaten by the savages.

At a distance, the great ant-eater has the appearance of a fox; and, for this reason, some travellers have given him the name of the *American fox*. He has strength sufficient to defend himself against a large dog, or even the *jaguar* or Brazilian cat. When attacked, he at first fights on end, and, like the bear, annoys the

enemy with the claws of his fore-feet, which are very terrible weapons. He then lies down on his back, and uses all the four feet; in which situation he is almost invincible, and continues the combat to the last extremity: even when he kills his enemy, he quits him not for a long time after. He is enabled to resist better than most animals; because he is covered with long bushy hair, his skin is remarkably thick, his flesh has little sensation, and his principle of life is very tenacious.

All the three ant-eaters are natives of the warm climates of America, as Brasil, Guiana, the country of the Amazones, &c. None of them are to be found in Canada, or the northern regions of the New World, and therefore should have no existence in the Old Continent. Kolbe* and Desmarchais†, however, mention these animals as natives of Africa; but they seem to have confounded the scaly lizard with the ant-eaters. Perhaps they have been misled by the following passage in Marcgrave: “*Tamandua-guacu, Brasiliensibus, Congensibus (ubi et frequens est) umbulu dictus.*” If by *Congensibus* Marcgrave meant the natives of Congo, the inference of Kolbe and Desmarchais, that the great ant-eater was found in Africa, would have been just. But Marcgrave certainly never saw this animal in Africa, since he acknowledges, that, even in America, he never saw more than stuffed skins of it.

* Descript. du Cap, par Kolbe, tom. iii. p. 43.

† Voyage de Desmarchais, tom. iii. p. 307.

Desmarchais says simply, that the great ant-eater is found both in Africa and America, without adding a single circumstance in proof of the fact. With regard to Kolbe, no dependence can be had on his testimony; for a man who saw, at the Cape of Good Hope, elks and lynxes perfectly similar to those of Prussia, might also see the ant-eater in that climate. The ant-eaters are never mentioned by any author among the natural productions of Africa and Asia. But all the travellers, and most of the historians of America, take particular notice of these animals. De Lery, de Laët *, le P. d'Abbeville †, Maffé ‡, Faber, Nieremberg §, and M. de la Condamine ||, agree with Piso, Barrere, &c., that the ant-eaters are natives of the warm climates of America. We must, therefore, conclude that Desmarchais and Kolbe have been deceived, and that these animals exist not in the Old Continent.

M. Vosmaër has made a very erroneous criticism on what I have said concerning the least ant-eater ¶.

“ I must remark,” says he, “ though contrary to the opinion of M. de Buffon, that

* Descript. des Indes Occidentales, par Jean Laët, p. 485, 556.

† Mission en l'Isle de Maragnon, par le Pere d'Abbeville, p. 248.

‡ Hist. des Indes, par Maffé, traduit par de Pure, p. 71.

§ Euseb. Nieremberg, Hist. Nat. Antverpiæ, p. 190.

|| Voyage de la Rivière des Amazones, par M. de la Condamine, p. 167.

¶ Descript. d'un Grand Ecureuil Volant, p. 6.

last year M. Tulbagh sent me an animal, under the name of *porc de terre*, which is the *myrmecophagus* of Linnæus; so that Desmarchais and Kolbe were right in maintaining that this animal was found in Africa, as well as in America. If we form a judgment from the specimen sent me, which is preserved in spirit of wine, appears to be new born, and is as large as a good pig, we must conclude the full grown animal to be of a considerable size. The following are its principal characters, as far as they could be remarked in an animal so young.

“The muzzle is pretty broad at the point, round, and somewhat compressed above. The ears are very broad, long, thin, pointed, and pendulous. On the fore-feet there are four toes; the first and third are of equal length, the second somewhat longer, and the fourth or exterior one a little shorter than the third. The four claws are very long, a little hooked, sharp, and nearly of an equal size. On the hind-feet there are five toes, the three intermediate ones being nearly equal in length, and the two exterior much shorter; the claws are smaller, and the two exterior ones are least. The tail, without being long, is thick, and terminates in a point. The two *myrmecophagi* of Seba, tom. i. tab. 37, fig. 2, and tab. 40, fig. 1, are certainly the same, and differ only in colour, and the figures given of them are good. This is a particular species, totally different from the *tamanduaguacu* of Marcgrave, or the *tamanoir* of M. de Buffon.”

From this passage, it might be thought that I

was deceived with regard to the animal represented, by Seba, tab. 37, fig. 2. However, I have said precisely the same thing with M. Vosmaër for I expressed myself in the following words: "The animal called *tamandua*, *myrmecophage d'Amerique*, by Seba, tom. i. p. 60, tab. 37, fig. 2, has no resemblance to any of the three of which we are here treating." Now, the three American animals which I mentioned, were the great, middle, and least ant-eaters. What M. Vosmaër remarks, therefore, contradicts nothing I have advanced; which amounts to this, that these three animals are peculiar to America, and not to be found in the Old Continent. This language is so precise, that M. Vosmaër can have nothing to oppose to it. If the *myrmecophagus* of Seba, tab. 37, fig. 2, is found in Africa, it only proves that Seba was deceived when he calls it the American *myrmecophagus*, but can have no effect upon what I have advanced, and still persist in maintaining, that the three ant-eaters are found in America, and not in Africa.

THE CAPE ANT-EATER*,

WE have often repeated that no African animals are found in South America, and *vice versa*. The species in question may lead inattentive observers (such as M. Vosmaër) into an error; but we may see by the description, as well as by the comparison of this figure with the American ant-eaters, that it is of a very different species, and that it scarcely resembles them in any thing except the want of teeth, and the long tongue. We have adopted the name of *cochon de terre*, which Kolbe has given to this ant-eater, in preference to that of *fourmillier*, which ought to be reserved for the American ant-eaters, since in effect this

MYRMECOPHAGA CAPENSIS. *M. palmis tetradactyllis, rostro longo, auriculis magnis pendulis, cauda corpore brevior ad apicem attenuata.* — *Lin. Syst. Nat. Gmel. i. p. 53.* — *Pall. Miscel. Zool. No. 6.*

COCHON DE TERRE. — *Buff. Hist. Nat. par Sonn. xxvii. p. 245, pl. 16, fig. 1.*

CAPE ANT-EATER. — *Penn. Hist. Quadr. ii. p. 261.* — *Shaw's Gen. Zool. i. p. 173, pl. 53.*

HABITAT

ad Caput Bonæ spei.

W.



CAPE ANT EATER.

animal differs essentially from the species as well as from the genus. The name of *cochon de terre* relates to its natural habits, and also to its form. By this name it is commonly known at the Cape. The following is the description which M. Allamand has given of this animal in his new supplement to my work.

“ M. de Buffon seems to have exhausted the subject of ant-eaters. The article which he has drawn up has cost him a great deal of trouble, as much on account of the researches he has made to avail himself of all that has been said of these animals, as from the necessity he has been under of correcting the faults of those who have gone before him, especially Seba; who has not only described it badly, but has ranked it among animals of a very different kind.

“ M. de Buffon, after having done away the confusion that prevailed in the history of these animals, admits but of three species of ant-eaters, the great, the middle, and the least; but afterwards he described an animal that appeared to be a new species of middle ant-eater, perhaps only a simple variety, and concludes all by saying that the ant-eaters are found only in the warmer parts of America, and that they do not exist in the Old Continent. It is true, that Desmarchais and Kolbe say that they are met with in Africa. but the former simply affirms the thing, without entering into particulars, or supporting his assertion with any proof: as to Kolbe, his evidence is so suspicious, that Buffon has been fully authorized in not depending upon him. I thought with

Buffon respecting Kolbe, and did not believe that there were ant-eaters in Africa; but captain Gordon has convinced me of my error, by sending the skin of one of these animals killed at the Cape of Good Hope, where they are known by the name of *cochons de terre*. This is precisely the same that Kolbe gave them. Thus I have made him amends, and here revoke my doubt of his veracity; and I am persuaded that M. de Buffon will do him the same justice. It is true, that M. Pallas has confirmed the testimony of Kolbe by his own observations; he has described the *foetus* of an ant-eater, sent from the Cape of Good Hope to the cabinet of the prince of Orange: but a *foetus* without its hair was not a proper object to give a just idea of the original animal, notwithstanding it might have been sent from the Cape: however, the name of *cochon*, by which it was called, begins to awaken my former prejudice against Kolbe.

“ I have succeeded very well in stuffing the skin sent me by Mr. Gordon, and it is from this specimen that the figure represented in the plate has been engraved. If we ought to call an animal an ant-eater that is without teeth, and which has a very long tongue that it buries in the ants' nest, in order to swallow the ants that attach themselves to it, there is no doubt that the creature I have represented deserves the name; notwithstanding, it differs greatly from the three species described by M. de Buffon, and which I think with him are peculiar to America.

“ It is almost as large as the great ant-eater,

The hairs on the head, the back, and the tail, are very short, and lying so close that they appear, as it were, glued to the skin: they are of a dirty gray colour, somewhat resembling the rabbit, but deeper: on the sides and belly the hairs are longer, and of a reddish colour; those covering the legs, which are by far the longest, are entirely black and white.

“ The head is almost a truncated cone, a little compressed towards its extremity; it is terminated by a snout, like that of the hog, in which are the nostrils, and which is continued an inch and a half beyond the lower jaw; here it is very small. The tongue is long, very thin, and flat, but larger than in the other ant-eaters, in which it is almost cylindrical. It has no teeth; its eyes are much nearer its ears than its snout; they are large, being an inch in length from one angle to the other; the ears (resembling those of the hog) are pointed, and six inches high; they are formed of a membrane almost as thin as parchment, and covered with hairs, but so short as scarcely to be perceived: I do not know if, in the living animal, they are pendent, like the ant-eater's. M. Pallas says that they are, but he decides from the *fœtus*, where their length makes them take this position, without leading us to conclude that they are so in the animal after birth. The tail is more than two thirds the length of the body; it is thick at its origin, and tapers to the end. The fore-feet are furnished with four toes; those behind have five:

all the toes are armed with strong claws, of which the longest are on the hind-feet, for they equal in length the toes themselves; they are round at the end, a little recurved, and calculated to dig the ground. It does not appear that they are able to grasp any thing firmly, or to defend themselves like the other ant-eaters; however, it ought to possess great strength in its legs, which are very large in proportion to its body.

" We see by the above description that this animal is very different from the great ant-eater, in its hair, its colour, its head, and its tail: it also greatly exceeds the middle ant-eater in size, from which it also differs in its fur, in its colour, and in its claws. I say nothing about its want of resemblance to the fourmillier, as no one can confound it with that animal. It belongs, then, to a fourth species at present unknown, and all that I can say for certain is, that it thrusts its tongue into ant-hills, and swallows the ants which adhere to it; and that it hides itself in holes. Although it has a tail which somewhat resembles that of the middle ant-eater, I doubt if it can use it, like that animal, for the purpose of suspending itself from the branches of trees; it does not appear sufficiently flexible, and the claws are not formed for climbing.

" I have already said that, at the Cape, they give it the name of *cochon de terre*; but it resembles the hog (and that very imperfectly) only in the elongated head, in the snout, and in the length of its ears: besides it differs essentially in

its want of teeth, in the tail, and particularly in the feet, as well as by the general conformation of the body.*

“For want of good authorities respecting this ant-eater, I have added, in a note, what Kolbe has said on the subject; since he has been more exact in the description than usual*.”

* “The fourth species of hogs is called *cochon de terre*; it bears a strong resemblance to red hogs (*Nota*, why to red hogs? it does not resemble them in its colours more than others), only the head is longer, and the snout more pointed: it has no teeth, neither are the bristles so strong; its tongue is long and edged; it has a long tail, and long and strong legs; it lives in the earth, and digs a cave with great spirit and quickness; if it gets only its head and fore-feet in the earth, it holds so fast, that the strongest man is unable to draw it back again.

“When hungry, it seeks for an ant-hill, and when it has found one, it looks round about to see if all is quiet, and that no danger is near: it never eats without taking this precaution; then it lies down, and placing its snout close to the ant-hill, thrusts out its tongue as far as possible: the ants get upon it in crowds, and when it is well covered the animal draws it in, and swallows all. It repeats this operation several times until it is satisfied. That it may procure its nourishment with greater ease, Nature, ever provident, has contrived that the upper part of this tongue, which receives the ants, shall be always covered with a viscous and gluey matter, which prevents the return of the weak prey when once their legs are entangled in it: this is their mode of feeding. Their flesh is very wholesome, and of a good flavour: the Europeans and Hottentots hunt them; nothing is more easy than to kill these animals, it is only to strike them a slight blow on the head with a stick.” — *Description of the Cape of Good Hope by Kolbe.*

THE SHORT-TAILED * AND THE LONG-TAILED MANIS †.

THESE animals are commonly known by the name of *scaly lizards*. We have rejected this de-

* MANIS.

CHARACTER GENERICUS.

Dentes nulli.

Lingua teres, extensilis;

Os angustatum in rostrum.

Corpus squamis tectum.

CHARACTER SPECIFICUS.

MANIS PENTADACTYLA. *M.* pedibus pentadactylis.—*Linn. Syst. Nat. Gmel.* i. p. 53.—*Schreb.* ii. p. 210, pl. 69.

MANIS BRACHYURA. *M.* cauda fere longitudine corporis.—*Erxleb. Mamm.* p. 96.

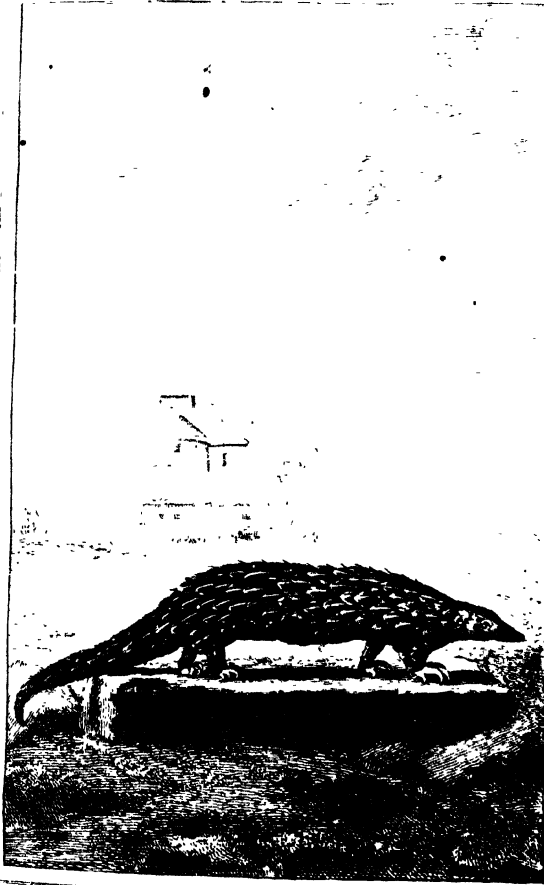
Philodotus pedibus anticis et posticis pentadactylis, squamis subrotundis.—*Briss. Quadr.* p. 29.

LACERTUS INDICUS SQUAMOSUS.—*Bont. Jar.* p. 60.

Armadillus squamatus major, seu diabolus tajovanicus Siamensium, ex insula Formosa.—*Seb. Thes.* i. p. 87, t. 53, fig. 5, junior; et t. 54, fig. 1, adulta.

Manis manibus pentadactylis, plantis pentadactylis.—*Dahlman. Act. Holmiens.* 1749, p. 174, t. fig. 3, bona.

LE PANGOLIN.—*Buff. Hist. Nat. par Sonn.* xxvii. p. 256, pl. 17.



SHORT-TAILED MANIS. .

nómination, 1. Because it is compounded; 2. Because it is ambiguous, and is applied to both spe-

SHORT-TAILED MANIS.—*Penn. Hist. Quadr.* ii. p. 253.—*Shaw's Gen. Zool.* i. p. 181, pl. 58.—*Nat. Miscell.* pl. 11.

HABITAT

in Guinea, China, India, et insulis Oceani Indici.

IF.

The back, sides, and upper part of the tail of these animals, are covered with large strong scales. The mouth is small, and the tongue long. They have no teeth.

The short-tailed scaly lizard has the back, sides, and legs, covered with blunt scales, and bristles between each. There are five toes on each foot, and the tail is not longer than the body. The ears are not unlike the human. The chin, belly, and inside of the legs are hairy.—*Penn. Synops. Quadr.* p. 329.

† CHARACTER SPECIFICUS.

MANIS TETRADACTYLA.—*M. pedibus tetradactylis.*—*Linn. Syst. Nat. Gmel.* i. p. 54.—*Schreb.* ii. p. 211, pl. 70.

MANIS MACROURA. *M. cauda corpore longiore.*—*Erxleb. Mamm.* p. 101.

Philodotus pedibus tetradactylis, squamis mucronatis, cauda longissima.—*Briss. Quadr.* p. 31.

LACERTUS SQUAMOSUS PEREGRINUS.—*Clus. Exot.* p. 374, fig. mediocr.

LACERTA INDICA Juannæ congener.—*Aldrov. Dig. Oriz.* p. 667, fig. mediocr. absque capite.

LE PHATAGIN.—*Buff. Hist. Nat. par Sonn.* xxvii. p. 256, pl. 17.

SCALY LIZARD.—*Grew. Rar.* p. 46.

LONG-TAILED MANIS.—*Penn. Hist. Quadr.* ii. p. 252, pl. 94.—*Shaw's Gen. Zool.* i. p. 180, pl. 55.—*Nat. Miscel.* pl. 36.

HABITAT

in India.

W.

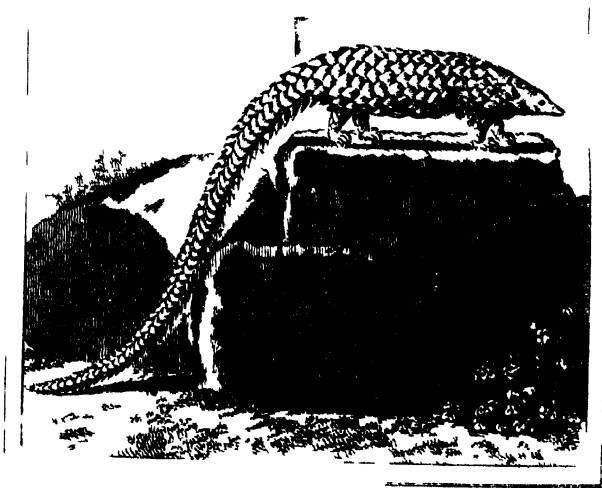
The long-tailed scaly lizard has a slender nose, which.

cies; 3. Because it is improper, these animals being not only of a different species, but of a different class from the lizards, which are oviparous reptiles; instead of which, the animals under consideration are viviparous quadrupeds *.

All lizards are entirely covered with a smooth skin, variegated with spots which resemble scales. But the short and long-tailed manis have no scales on the throat, breast, and belly. The long-tailed manis, like other quadrupeds, has hair on all the inferior parts of the body; and the short-tailed manis has, on these parts, a smooth skin only, without hair. The scales which cover the other parts of both these animals adhere not entirely to the skin, but are strongly fixed by their under part only. Like the quills of the porcupine, they are moveable, and are elevated or depressed, according to the will of the animals. When irritated, they erect their scales, and particularly when they roll themselves up like a ball. These scales are so large, hard, and poignant, that they repel every animal of prey. They form an armour which wounds as well as resists. The most cruel and famished creatures, as the

with the head, is smooth. The body, legs, and tail, are guarded by long, sharp-pointed, striated scales. The throat and belly are covered with hair. The legs are short. There are four claws on each foot, one of which is very small. The tail tapers a little, but ends blunt. The length, from nose to tail, is fourteen inches and a half, and that of the tail is three feet four inches and a half.—*Penn. Synops. Quadr.* p. 328.

* The author adopts the East Indian names, *pangolin*, and *phutagen*.



LONG TAILED MANIS

tiger, panther, &c., endeavour in vain to devour these animals. They trample upon, and toss them about; but, whenever they attempt to seize them, they receive very dangerous and painful wounds. No animal of prey is able to face, crush, or suffocate them, although it loads them with its whole weight. The fox is afraid of the hedgehog when rolled up; but he forces it to extend, by trampling on it with his feet. As soon as the head appears, he seizes it by the snout, and thus accomplishes his purpose. But, of all animals, without excepting the porcupine, the armour of the manis is the most defensive. When these animals contract their bodies, and present their armour, they brave the fury of all their enemies. Besides, when rolled up, these animals assume not, like the hedgehog, a globular figure: their body, in contracting, takes the form of a clue; but their long thick tail remains without, and serves as a ring or belt to the body. This exterior part, by which it would appear the animals might be seized, defends itself; for it is furnished, both above and below, with scales as hard and sharp as those which cover the body; and as it is convex above and flat below, and has nearly the figure of a half pyramid, the angular sides are covered with sharp erected scales; so that the tail seems to be still more carefully defended than the body, the inferior parts of which are deprived of scales.

The short-tailed manis is larger than the long-tailed kind. His fore-feet are covered with scales

to their extremity ; but the feet of the long-tailed species, and even a part of the fore-legs, are covered with hair only. The scales of the former are larger, thicker, more convex, and less chamfered than those of the latter, which are armed with three sharp points, while those of the short-tailed manis are not pointed, but uniformly sharp. The long-tailed manis has hair on the inferior parts of the body : the short-tailed kind has no hair under the body ; but, between the scales which cover the back, there are some hairs as thick and long as hogs' bristles, which are wanting in the long-tailed species. These are all the essential distinctions that we have observed by examining the stuffed skins of both these animals, which differ so much from all other quadrupeds, that they have been regarded as a kind of monsters. The differences we have pointed out, being general and constant, authorize us to conclude the short and long-tailed manis to be distinct species. We recognised these relations and differences, not only by inspecting three subjects, but likewise by perusing all the remarks of travellers and naturalists.

The short-tailed manis, when full grown, is from six to eight feet long, including the tail, which is nearly the length of the body, but appears to be proportionally shorter while the animal is young ; the scales are also smaller and thinner, and of a paler colour ; but, in the adult animal, their colour becomes deeper, and they acquire such a degree of hardness as to resist a

musket ball*. The long-tailed manis, as formerly remarked, is much less than the short-tailed species. Both of them have some relation to the great and middle ant-eaters; for they feed upon ants, have very long tongues, a narrow mouth, without any apparent teeth, very long bodies and tails, feet and toes nearly of the same size and figure, though different in number, both species of manis having five toes to each foot, while the ant-eaters have only four on the fore-feet. The latter are covered with hair, and the former with scales; neither are they natives of the same continent. The ant-eaters are found only in America, and the two species of manis in the East Indies and Africa, where they are called *quogelo*† by the Negroes, who eat the flesh of

* In Bengal, says Pennant, it is called in the Sanskrit language, Vajracite, or the thunderbolt reptile, from the excessive hardness of its scales; many small stones are sometimes found in its stomach, probably swallowed to promote digestion. There is a very good account of this animal, published in the Asiatic Researches, vol. ii. p. 376.

III.

† We find in the woods a quadruped which the Negroes call *quogelo*. From the neck, to the extremity of the tail, it is covered with sharp scales, resembling the leaves of the artichoke. They are close, and so thick and strong as to defend it against the claws and teeth of the most rapacious animals. It is perpetually chased, and easily overtaken, by the tigers and leopards. But, as its claws and mouth would be a feeble defence against the dreadful tusks and talons of these animals, Nature has taught it to roll itself up like a ball, by folding its tail under the belly, and contracting its body in such a manner as to present on all sides the sharp points of its scales. The tiger or leopard, when they turn the creature too rudely

these animals, which they reckon delicate and wholesome, and use their scales for several purposes. In fine, these creatures have nothing disgusting about them but their figure. They are gentle and innocent, feeding only on insects. They run slowly, and cannot escape from a man, but by concealing themselves in holes of rocks, or in those they dig in the earth, where the females bring forth their young. They are two extraordinary species, not numerous, and very useless. The oddness of their form seems to be intended to constitute the last shade between the figure of quadrupeds and that of reptiles.

with their paws, receive such wounds as oblige them to retire. The Negroes kill it with battons, sell the skin to the Whites, and eat the flesh, which they say is white and delicate. Its tongue is enormously long, and covered with a viscid liquor. It goes in quest of ants' nests, and the haunts of insects; extends its tongue, which it either pushes into their holes, or lays it flat upon the places where they pass. These insects, attracted by the odour, quickly run toward the tongue, remain entangled in the viscid liquor; and, when the tongue is properly loaded with them, the animal retracts it, and devours them. This creature is not mischievous. He never attacks any person, but, provided he can find a sufficient quantity of ants, is perfectly contented. The largest of this species that has been observed, is eight feet long, comprehending the tail, which is four feet. — *Voyage de Desmarchais*, tom. i. p. 200.

THE ARMADILLO.

WHEN a quadruped is mentioned, the very name seems to convey the idea of an animal covered with hair. In the same manner, when we speak of a bird or a fish, feathers and scales present themselves to the imagination, and appear to be inseparable attributes of these beings. Nature, however, as if she intended to withdraw herself from all method, and to elude our most general views, contradicts our ideas and denominations, knows nothing of our arbitrary characters, and astonishes us still more by her exceptions than by her laws. Quadrupeds, which should be regarded as constituting the first class of animated nature, and are, next to man, the most conspicuous creatures in this world, are, nevertheless, neither superior in every respect, nor separated, by permanent characters or attributes, from all other beings. The first character, that of having four feet, and from which their name is derived, is found among the lizards, frogs, &c., which differ so much from quadrupeds in every other article, that they have with propriety been thrown into a distinct class. The second general property, that of being viviparous, belongs not exclusively to quadrupeds, but

is common to them and the cetaceous animals. In fine, the third attribute, that of being covered with hair, which appears to be the least equivocal, because it is the most conspicuous, exists not in several species which cannot be retrenched from the order of quadrupeds, since, with the exception of this character alone, their resemblance to each other is complete: and, as these seeming exceptions of Nature are, in reality, but the shades she employs to connect beings of the most remote kinds, we ought to seize these singular relations, as often as they present themselves. The armadillos, instead of hair, are covered, like the turtles, the lobsters &c., with a solid crust. The manis is armed with scales similar to those of fishes. The porcupine carries a kind of prickly feathers, without vanes, but having quills like those of birds. Thus, in the class of quadrupeds alone, and in the most constant and apparent character of these animals, that of being covered with hair, Nature varies, by making them approach the three very different classes of birds, fishes, and the crustaceous tribes. Hence we ought never to judge of the nature of beings by a single character; for it will always be imperfect and fallacious. Even two or three characters, though extremely general, are often insufficient; and, as I have frequently remarked, it is only by the union of all the attributes, and an enumeration of all the characters, that a judgment can be formed concerning the permanent and essential qualities of the productions of Nature. Accurate descriptions, with-

out any attempt toward definitions, a more scrupulous examination of the differences than of the similarities, a particular attention to the exceptions and even to the slightest shades, are the true guides, and, I will venture to affirm, the only means we possess of investigating Nature. If the time lost in framing definitions and methodical arrangements, had been employed in making good descriptions, we should not, at this day, have found Natural History in her infancy, but should have had less difficulty in removing her swaddling cloths and her toys, and, perhaps, might have advanced her age; for we should have written more for science, and less against error.

But to return to our subject. Among viviparous quadrupeds, as we have seen, there are several species of animals which are not covered with hair. The armadillos alone constitute an entire genus, which includes a number of distinct species, and all of them are covered with a crust resembling bone. This crust covers the head, neck, back, flanks, rump, and extends to the extremity of the tail. The crust itself is also covered with a thin, smooth, transparent skin. The only parts to which this crust extends not, are the throat, the breast, and the belly, which are covered with a granulated skin, like that of a deplumed hen; and, upon an accurate inspection of these parts, we discover, in different places, the rudiments of scales, of the same substance with the crust. Hence the skin of these animals, even where it is most flexible, has a

tendency to become ossous ; but the ossification is completed in those places only where the skin is thickest, as on the superior and external parts of the body and on the limbs. The crust consists not of one piece, like that of the turtle, but is divided into several bands, connected to each other by membranes which allow a certain degree of movement to this coat of mail. The number of these bands depends not, as has been imagined, on the age of the animal. The new born and the adult armadillo have the same number of bands, as appears by comparing the young with the old; and, though we cannot be certain that those which have more or fewer bands never intermix or produce, it is at least very probable, since the difference in the number of moveable bands is constant, that they are either distinct species, or permanent varieties, occasioned by the influence of different climates. In this uncertainty, which time alone can remove, we have chosen to treat of all the armadillos under one article, enumerating, at the same time, each kind as if it were a particular species.

Le Père d'Abbeville * appears to have first distinguished the armadillos by different names, which have been adopted by most subsequent authors. He has pointed out pretty clearly six species: 1. The twelve-banded armadillo, or *kabassou*. 2. The eight-banded, or *tafouète*.

* Mission au Maragnon, par le Père d'Abbeville, p. 247.

3. The six-banded, or *encuberto* of Marcgrave.
 4. The three-banded, or *tatu-apara*. 5. The eighteen-banded, or *cirquinçon*. 6. The nine-banded, or *cachichame*. The different species have been confounded by other travellers. But we have occasion to borrow the descriptions of two kinds only, having seen the other four*.

All the armadillos, except the eighteen-banded, have two bony shields, one on the shoulders, another on the rump. Each of these consists of one solid piece. But the cuirass, which is likewise osseous, and covers the body, is divided transversely into more or fewer moveable bands, connected by a flexible skin. But the armadillo with eighteen bands has one shield only, which

* Molina says that the Spaniards give this animal the name of armadillo because the cuirass is formed of several lamina or bands joined to each other. It is very common at Cujo, where it is called *quirquincho*. The females are very prolific, producing almost every month, and bringing forth four little ones at a time. The flesh is more delicate than that of the Guinea pig.

The armadillo inhabits, in preference, the valleys of the Andes. Four species may there be distinguished, viz. the four-banded, the eight-banded, the eleven-banded, and the eighteen-banded armadillo. These four species, says Molina, belong to the *quirquinçi* of M. de Buffon; these animals roll themselves up like a hedgehog, and thus often escape their enemies. To force them open, it is necessary to apply fire to their armour. The three first species run tolerably fast, and always in a straight line, the conformation of their cuirass not permitting them to turn. When arrived at a certain distance from their pursuers, they begin to burrow with their fore-feet; and to make them let go their hold, the hunters run the point of a little stick into their backsides.

is upon his shoulders. The rump, instead of a shield, is covered with moveable bands similar to those above mentioned. We shall now describe each species particularly, according to the number of bands.

THE THREE-BANDED ARMA- DILLO*.

CLUSIUS is the first author who describes this animal; and, though his description was taken from a drawing only, it is easy to perceive from

* DASYPUS.

CHARACTER GENERICUS.

Dentes molares plures, absque primoribus, absque lanariis.

Corpus cataphractum testa ossea, zonis intersecta.

CHARACTER SPECIFICUS.

DASYPUS TRICINCTUS. D. cingulis tribus, pedibus pentadactylis. — *Linn. Syst. Nat. Gmel.* i. p. 55. — *Schreb.* ii. p. 215, pl. 71, A. 72, 1, 2. — *Eulcb. Mamm.* p. 102.

Cataphractus scutis duobus, cingulis tribus. — *Briss. Quadr.* xxiv.

ARMADILLO, sive tatou genus alterum. — *Clus. Exot.* p. 109, fig. mediocr. in pedibus vitiosa.

TATU APARA. — *Marcgr. Bras.* p. 232, fig. bona. — *Ray's Quadr.* p. 234. •

TATOU sive ARMADILLO. — *Red. Exp.* 91, pl. 92.

Tatu seu Armadillo orientalis, lorica ossea toto corpore tectus. — *Seb. Mus.* i. p. 62, pl. 38, fig. 2, 3.

L'APAR ou LE TATOU A TROIS BANDES. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 277. •

THREE-BANDED ARMADILLO. — *Penn. Hist. Quadr.* ii. p. 246, *Shaw's Gen. Zool.* i. p. 188, pl. 57.

the remarkable characters of having three moveable bands on the back, and a short tail, that it is the same species of which Marcgrave has given a good description under the name of, *tatu apara*. The head is oblong, and almost pyramidal; the eyes are small, the ears short and rounded, and the top of the head is covered with a helmet consisting of one piece. On all the feet there are five toes. The two middle claws of the fore-feet are very large, the two lateral ones smaller, and the fifth, or exterior one, is the least. The claws of the hind-feet are shorter and more equal. The tail exceeds not two inches in length, and is wholly covered with a shell or crust. The body is a foot long, and about eight inches over at the broadest part. The back, or cuirass, is divided into four joints, and composed of three transverse moveable bands, by which the animal is enabled to bend its body and to roll itself up like a ball. The skin which forms the joints is very flexible. The shields which cover the shoulders and rump consist of pentangular pieces, very equally ranged. The three moveable bands between the two shields are composed of square or oblong pieces, and on

HABITAT

in America australi. In India orientali vix videtur reperiri.

W.

It has short, but broad rounded ears. The crust on the head, back, and rump, is divided into elegant pentangular, tuberculated segments. There are three bands in the middle, five toes on each foot, and the tail is short. — *Pennant's Synopsis, Quadr.* p. 323.

each piece there is a number of lenticular scales of a yellowish white colour. Marcgrave adds, that when the creature lies down to sleep, or when touched by any person, he gathers his feet together, puts his head below his belly, and makes the whole body so perfectly round, that he has more the appearance of a sea-shell than of a land animal. This contraction is effected by means of two large muscles on the sides of the body; and it is with difficulty that the strongest man can force an extension with his hands. Piso and Ray have added nothing to Marcgrave's description. But it is singular that Seba, who has given us a figure and description nearly the same with those of Marcgrave, should not only neglect to mention that author, but assert, with confidence, "that this animal is unknown to the naturalists; that it is extremely rare; that it is found in the most remote countries of the East Indies *," &c., whilst, in fact, this Brazilian armadillo is excellently described by Marcgrave, and the species as common as any other, not indeed in the East Indies, but in America, where it is very frequent †. The only real difference

* Hunc remotissimi et maxime versus orientem siti Indiæ loci proferunt. — Animal hocce rarum admodum et haud vulgare est, nec ejus mentionem ab ullo autorum factam reperimus, &c. — *Seba*, vol. i. p. 62.

† This species inhabits the province of Tucuman, and the country about Buenos Ayres. It rolls itself up with more facility than the other armadillos; for, when about to be taken, it hides its head, its tail, and its legs, forming itself into a body as round as a bowl. 17

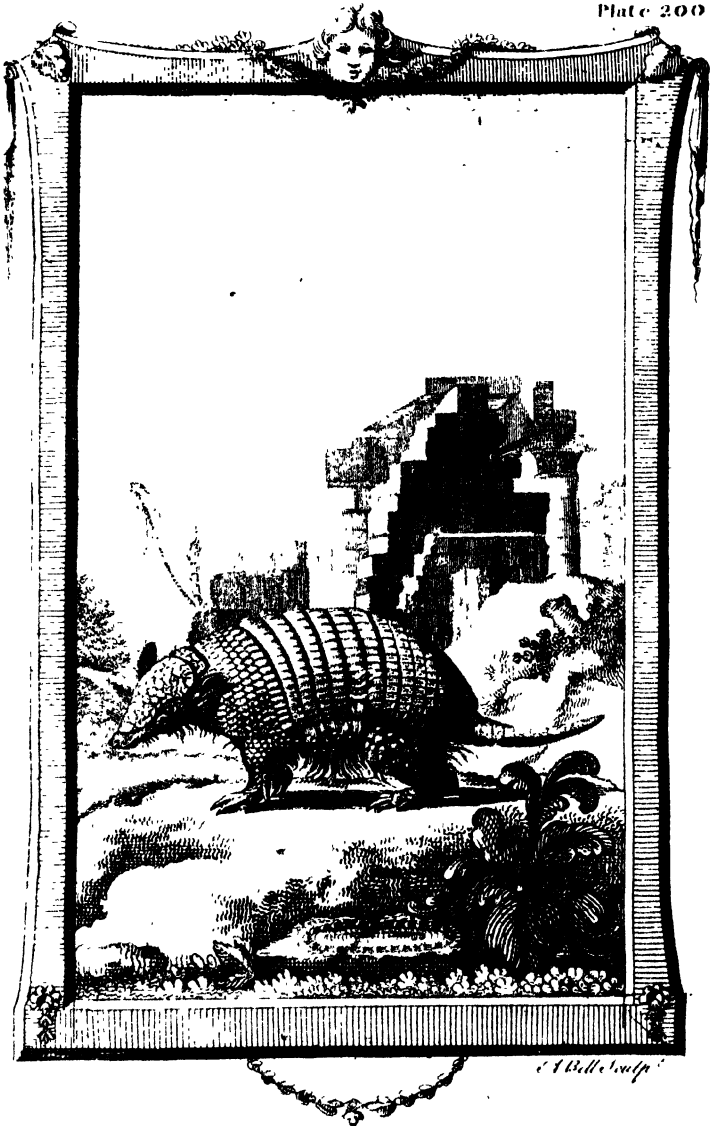
between the description of Seba and that of Marcgrave is, that the latter gives the animal five toes to each foot, and the former only four. One of them must be wrong; for they both evidently describe the same animal.

Fabius Columna* has described and given figures of the dried crust of an armadillo, contracted in the form of a ball, which appears to have had four moveable bands. But, as this author was totally ignorant of the animal whose skin or shell he describes; as he knew not the very name of the *armadillo*, though mentioned by Belon more than fifty years before, but gave it the compound appellation of *cheloniscus*; besides, as he acknowledges that the crust he describes had been pasted together, and that some pieces were wanting, we have no proper authority to pronounce, as our modern nomenclators have done†, that an armadillo with four moveable bands has an existence in nature, especially as no notices have been communicated by any other naturalist, concerning this animal, since the imperfect and suspicious account given by Fabius Columna in the year 1606. If it did exist, it would certainly have found its way into some of our cabinets, or been observed by travellers.

* Aquatil. et terrest. animal. Obs. Fab. Columna auctore, p. 15, tab. 16, fig. 1, 2, 3.

† *Dasypus quadricinctus*, cingulis quatuor. — Linn. *Syst. Nat.* p. 54.

Cataphractus scutis duobus, cingulis quatuor. — Briss. *Regn. Anim.* p. 39.



SIX BANDED ARMADILLO.

THE SIX-BANDED ARMADILLO*.

THIS armadillo is larger than the former. The top of the head, the neck, body, limbs, and tail, are covered with a very hard osseous crust,

* CHARACTER SPECIFICUS.

DASYPUS SEXCINCTUS. D. cingulis senis, pedibus pentadactylis. — *Linn. Syst. Nat. Gmel.* i. p. 55. — *Schreb.* ii. p. 218, pl. 71. **B.** — *Erxleb. Mamm.* p. 105.

Cataphractus scutis duobus, cingulis sex. — *Briss. Quadr.* p. 25.

TATOU. — *Bellon, Obs.* p. 204, cum fig. mediocri, cingulis nimis.

Tatu sive Armadillo prima Marcgravii. — *Ray's Quadr.* p. 233.

TATU et TATU-PABA BRASILIENSIBUS. — *Marc. Bras.* p. 231.

ARMADILLO. — *Olear Mus.* p. 7, t. 6, fig. 4.

L'ENCOUBERT ou LE TATOU A SIX BANDES. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 283, pl. 23.

SIX-BANDED ARMADILLO. — *Penn. Hist. Quadr.* p. 247. — *Shaw's Gen. Zool.* i. p. 189, pl. 58.

HABITAT

in Brasilia et Mexico.

W.

The crust of the head, shoulders, and ramp, is formed of angular pieces. It has six bands on the back, between which, and also on the neck and belly, are a few scattered hairs. The tail is not the length of the body, very thick at the base, and tapers to a point. There are five toes on each foot. — *Penn. Synops. Quadr.*

composed of pretty large pieces, most elegantly placed. Each of the two shields on the shoulders and rump consists of one piece. There is, indeed, beyond the shield on the shoulder, and near the head, a moveable band which enables the animal to bend his neck. The shield on the shoulders consists of five parallel rows, which are composed of pieces that have five or six angles, with a kind of oval figure in each. The cuirass on the back, or the part between the two shields, is divided into six bands, connected to each other, and to the shields, by seven junctures of a thick flexible skin. These bands consist of large square or oblong pieces. On the skin of the joints there are several whitish hairs, similar to those on the throat, breast, and belly. All the inferior parts of the body, instead of a hard crust, are covered with a granulated skin. The shield on the rump has a fringed border, the mosaic work of which resembles that of the moveable bands; the rest is composed of pieces very similar to those of the shield on the shoulders. The crust of the head is long, broad, and consists of one piece, as far as the moveable band on the neck. The muzzle is sharp, the eyes small and sunk, and the tongue narrow and pointed. The ears, which are naked, having neither hair nor crust, are short and brown, like the skin of the dorsal junctures. There are eighteen teeth in each jaw, and five toes on each foot, with pretty long, rounded, and rather narrow than broad claws. The head and muzzle nearly resemble those of a pig. The tail is thick at its origin, and gradually

tapers toward the point, where it is very thin, and rounded. The colour of the body is a reddish yellow. The animal is commonly plump and fat; and the penis of the male is very conspicuous. He digs the earth with great ease by the assistance of his snout and claws. He lives in his burrow during the day, and comes out in the night only to search for food. He drinks often, and feeds upon fruits, roots, insects, and birds, when he can seize them *.

Our original figure of the six-banded armadillo was taken from a preserved crust. The figure now represented was drawn from the life by M. de Séve, who, at the same time, sent me the following description :

“ The male is fourteen inches long, without reckoning the tail, and corresponds pretty well with the description given in your work. However, in your description, it is said the shoulder-shield consists of five parallel rows of small pentangular pieces, with an oval in each. But these

* “ This animal appears to vary as to the number of its bands : the specimens both in the British and Leverian Museums having eight bands instead of six : in all other respects they agree with the six-banded one. A particular character of this species seems to be the remarkable breadth and flatness of the head, which is larger in proportion than others of the genus. The Leverian eight-banded variety is of a very fair yellowish white : that in the British Museum is of a much deeper colour, approaching to an iron-gray, but whitish in some parts.” — *Shaw's Gen. Zool.* i. p. 189.

The specimen in the British Museum is still remaining : the other was disposed of in Parkinson's sale of the noble Leverian collection.

W.

characters seem to vary; for, in the animal I have drawn, the shoulder-shield is composed of six parallel rows, of which the small pieces are irregular hexagons. The rump-shield consists of ten parallel rows, and the small pieces are narrow squares. The rows near the tail lose their square form, and become more round. The tail, a part of which was broken off, is four inches and a half in length; but in the drawing I have made it six inches. In walking, it carries the tail high, and a little crooked. The trunk is covered with an osseous crust as well as the body. The trunk has six unequal rows, composed of small irregular hexagons. The head is three inches ten lines long, and the ears one inch three lines. The eye, instead of being sunk, as remarked in your history, is indeed very small, but the globe is prominent, and well defended by eyelids. The body is very fat, and the skin of the belly is wrinkled, and full of small tubercles, from which issue a number of pretty long white hairs. The crust, on the broadest part of the body, is six inches seven lines. The fore-legs are two inches two lines long, and those behind three inches four lines. The fore claws are very long, the longest being one inch three lines, the next one inch two lines, and the smallest ten lines. The length of the hind claws is at most half an inch. The legs are covered, as far as the claws, with a yellowish scaly skin. When the animal walks he supports himself on the tips of the claws of the fore-feet. His penis, when drawn out in a state of repose, is six inches seven lines long,

near four lines thick, and must augment considerably during its erection. When the penis stretches, it lies upon the belly like a snail, leaving a space of a line or two between each circumvolution. I have been told, that, when these animals copulate, the female lies on her back to receive the male. The one I have described was only eighteen months old."

THE EIGHT-BANDED ARMA- DILLO*.

THIS armadillo is not so large as the six-banded species. The head is small, the muzzle sharp, the ears erect, and pretty long, and the tail is proportionably longer, and the limbs shorter than those of the six-banded armadillo. The eyes are small and black; there are four toes on the fore, and five on the hind-feet; the head is

* CHARACTER SPECIFICUS.

DASYPUS OCTOCINCTUS. D. scutis duobus, cingulis octo.—*Linn. Syst. Nat. Gmel.* i. p. 56.—*Schreb.* ii. p. 222, pl. 73, 76, fig. 5, 6.

Cataphractus scutis duobus, cingulis octo.—*Briss. Quadr.* p. 27.

AIATOCHTLI.—*Hernand. Hist. Mex.* p. 314.

LE TATUETE, OU TATOU A HUIT BANDES.—*Buff. Hist. Nat.* par *Sonn.* xxvii. p. 290.

EIGHT-BANDED ARMADILLO.—*Penn. Hist. Quadr.* ii. p. 248.

HABITAT

in Brasilia et Guiana.

W

This armadillo has upright ears, two inches long, small black eyes, eight bands on the sides, four toes on the fore-feet, and five on the hind. The length, from nose to tail, is about ten inches, and that of the tail nine.—*Penn. Synops. Quadr.* p. 325.

covered with a helmet, the shoulders and rump with two shields, and the body with a cuirass composed of eight moveable bands connected to each other and to the two shields by nine junctures of flexible skin. The tail is likewise covered with eight moveable rings of crust, and nine joints of flexible skin. The colour of the cuirass on the back is an iron gray, and the flanks and tail are of a whitish gray mixed with spots of iron gray. The belly is covered with a whitish, granulated skin, interspersed with some hairs. The head of the individual described by Marcgrave was three inches long, the ears nearly two, the legs about three, the two middle toes of the fore-feet one inch, and the claws half an inch. The length of the body, from the neck to the origin of the tail, was seven inches, and that of the tail nine. The crust of the shields was interspersed with prominent white spots of the size of lentils. The moveable bands were marked with triangular figures. This crust is not very hard; for the smallest shot pierces it and kills the animal, whose flesh is white, and extremely delicate*.

* This species is very common in Paraguay, particularly in the province of Buenos Ayres.

THE NINE-BANDED ARMA- DILLO*.

NIEREMBERG'S description of this animal is extremely imperfect; those of Wormius and Grew are much better. Wormius's individual

* CHARACTER SPECIFICUS.

DASYPUS NOVENCINCTUS. D. cingulis novem, palmis tetradactylis, plantis pentadactylis. — *Linn. Syst. Nat. Gmel.* i. p. 56. — *Schreb.* ii. p. 223, pl. 74 et 76, fig. 7—10. *Erxleb. Mamm.* p. 109.

Cataphractus scutis duobus, cingulis novem. — *Briss. Quadr.* p. 42.

TATU-ETE BRASILIENSIS. — *Marc. Bras.* p. 231.

ARMADILLO. — *Olear. Gott. Kunst.* p. 7, t. 6, fig. 4, sat bona.

TATU ou ARMADILLO AMERICANUS. — *Seb. Thes.* i. p. 45, t. 50, fig. 1, bona; et p. 57, t. 53, fig. 8, pulli.

TATOU. — *Gmel. Quadr.* p. 324.

LE CACHICAMA ou TATOU A NEUF BANDES. — *Buff. Hist. Nat. par Bonn.* xvii. p. 205, pl. 19, fig. 1.

FIG-HEADED ARMADILLO. — *Grew. Mus.* p. 18. — *Ray's Quadr.* p. 233.

AN AMERICAN ARMADILLO. — *Watson, Phil. Trans.* lvii. p. 57, pl. 7.

NINE-BANDED ARMADILLO. — *Penn. Hist. Quadr.* ii. p. 248. — *Bew. Quadr.* p. 465. — *Shaw's Gen. Zool.* i. p. 190, pl. 57.



NINE-BANDED ARMADILLO.

was an adult, and one of the largest of the species; that of Grew was younger and smaller. We shall only give their descriptions as far as they correspond with our own specimen. Besides, it is probable that the nine-banded armadillo is not a distinct species from the eight-banded; for, in every other respect, they seem to have a perfect resemblance to each other. We have two eight-banded armadillos, which are dried, and appear to be males; and we have seven or eight with nine bands; one of them, which is entire, is a female, the others are so disfigured in drying, that the sex is not distinguishable. It would appear, therefore, that the eight-banded is the male, and the nine-banded the female. This is only a conjecture, which I mention here, because, in the following article, we shall see two armadillos, one of which has more rows on the rump-shield than the other, and yet their resemblance is so great, that this difference may depend solely on sex; for it is not improbable, that a greater number of rows and of

HABITAT

in America meridionali frequens præsertim in Gujana.

W.

This species has long ears. The crust on the shoulders and rump is marked with hexangular figures. There are nine bands on the sides, distinguished by transverse cuneiform marks. The breast and belly are covered with long hairs. There are four toes on the fore-feet, and five on the hind. The tail is long and taper. The length of the whole animal is three feet. — *Penn. Synops. Quadr.*

moveable bands may be necessary for facilitating the gestation and delivery of the females.

In the individual described by Wormiüs, the head was five inches long, from the end of the muzzle to the ears, and eighteen inches from the ears to the origin of the tail, which last was a foot in length, and composed of twelve rings. In an individual of the same species described by Grew, the head was three inches, the body seven and a half, and the tail eleven. The proportions of the head and body correspond very well; but the difference in the tail is too considerable; and, it is probable, that, in Wormiüs's individual, the tail had been broken, for it ought to have exceeded a foot in length. As in this species the tail tapers to a point as small as an awl, and is at the same time very brittle, it is rare to preserve a specimen with the tail entire, as in that described by Grew •.

* The following are Dr. Shaw's remarks on the variations which take place on the nine-banded armadillo.

“ Though this species preserves, in general, its specific character of *nine bands*; yet this is not always to be depended on, since specimens sometimes occur in which only *eight* bands are visible. A specimen of this kind occurs in the British Museum; and the count de Buffon assures us, that he has observed two specimens with eight bands only, which in every other respect perfectly resembled the nine-banded ones. He is therefore of opinion (and in this we perfectly agree with him), that the number of bands, in this species, constitutes not a specific, but a sexual difference: the eight-banded one he supposes to be the male. The general colour of this species is a palish iron-gray; but specimens often occur in Museums of a yellowish-brown cast, having probably lost

a part of their original tinge. The scales on the anterior and hinder parts are also sometimes of an angular form instead of round.

“ The young specimens of this animal also exhibit a difference as to the pattern or marking of the bands: which, instead of the triangular or wedge-shaped marks before described, have a simple series of long oval marks throughout each band; and the ultimate bands are not so distinctly defined as in the adult animal.

“ The seven-banded armadillo, *Dasypus septemcinctus*, of Linnæus and others, is not a distinct species, but a mere variety of this; as is also the eight-banded armadillo, *Dasypus octocinctus*.—Linn. Syst. Nat. Gmel.”—Gen. Zool. i. p. 191.

W.

THE TWELVE-BANDED ARMADILLO*.

THIS animal seems to be the largest of the armadillo kind. Its head is thicker and broader, and its muzzle not so slender as those of the

* CHARACTER SPECIFICUS.

DASYPUS UNICINCTUS. D. tegmine tripartito, pedibus pentadactylis. — *Linn. Syst. Nat. Gmel.* i. p. 54.

DASYPUS DUODECINCINCTUS. D. cingulis duodecim, pedibus pentadactylis. — *Erzleb. Mam.* p. 111.

Cataphractus scutis duobus, cingulis duodecim. — *Briss. Quadr.* p. 43. — *Schreb. il.* p. 225, pl. 75, 76, fig. 11, 12.

TATU seu ARMADILLO AFRICANUS. — *Seb. Mus.* i. p. 47, pl. 30, fig. 3. mas. et fig. 4. femina.

LE KASSOU ou TATOU A DOUZE BANDES. — *Buff. Hist. Nat. par Buffon* xvii. p. 302, pl. 19, fig. 2 et 3.

TWELVE-BANDED ARMADILLO. — *Penn. Zool. Quadr.* ii. p. 249, pl. 53. — *Quoy & Gmel. Zool.* i.

with hexangular ones. It has twelve bands on the sides, five toes, with very large claws, on the fore-feet, and five lesser on the hind. The tail is shorter than the body, and there are some scattered hairs on the body. — *Penn. Synops. Quadr.* p. 326.



TWELVE-BANDED ARMADILLO.



TWELVE-BANDED ARMADILLO.

other species. The legs and feet are also thicker, and the tail has no crust, a peculiarity which sufficiently distinguishes it from all the others. It has five toes on all the feet, and twelve distinct moveable bands. The shield on the shoulders consists of four or five rows only, each of which is composed of pretty large quadrangular pieces. The moveable bands are likewise composed of large and almost square pieces. Those which compose the rump-shield are nearly similar to those on the shoulders. The helmet on the head consists of large, irregular pieces. Between the joints of the moveable bands, and in other parts of the armour, there are some hairs, like hog's bristles. Upon the breast, belly, legs, and tail, we perceive the rudiments of scales, which are round, hard, and polished, like the rest of the crust, and, round these, are small tufts of hair. The pieces which compose the helmet, the two shields, and the cuirass, being proportionably larger and fewer in number in the twelve-banded than in the other armadillos, entitle us to conclude that it is the largest of the kind. In that represented in the figure, the head was seven inches long, and the body twenty-one. But we are uncertain whether that represented in the former plate belongs to the same species. They are similar in many respects, particularly in having twelve moveable bands. But they likewise differ in so many articles, that it is perhaps rash to ascribe these differences to sex alone.

M. de la Borde remarks, that there are two species of armadillos in Guiana. The largest is black, and weighs from eighteen to twenty pounds. The other, which is brown, or rather iron-coloured, has three claws of different lengths. Its tail is soft, and without any armour, being covered with a simple skin. It is much smaller than the other, and weighs about three pounds only.

“The large armadillos,” says M. de la Borde, “bring forth eight, and sometimes ten at a litter, in their holes, which they dig very deep. When attempts are made to unkennel this animal; he labours hard to render the hole still deeper, and descends almost perpendicularly. He goes out in the night only, and feeds upon worms, woodlice, and ants. His flesh is good, and, in flavour, somewhat resembles that of a pig. The small iron-coloured armadillo brings forth only four or five young; but she digs still deeper, and is more difficult to catch. When it rains, these animals go out during the day; but, in fair weather, they remain in their holes till night. They are always solitary; and they are known to be in their holes by a number of flies which follow their scent. When the hunter digs in order to seize them, they dig likewise; and, by throwing the earth behind, shut up the mouths of their holes so completely, that no smoke can enter. The females bring forth in the beginning of the rainy season.”

The large black armadillo of M. de la Borde,

may be referred to the twelve-banded species, which is the largest of all the armadillos; and the small iron-coloured kind may be referred to the eight-banded armadillo, though M. de la Borde says, that its tail is naked, a fact which merits confirmation.

THE EIGHTEEN-BANDED ARMADILLO*.

MR. GREW first described this animal from a skin preserved in the cabinet of the Royal Society. All the other armadillos have two shields, one on the shoulders, and another on the rump: But the eighteen-banded species has only one

* CHARACTER SPECIFICUS.

DASYPUS OCTODECIMCINCTUS. — D. cingulo simplici. — *Linn. Syst. Nat. Gmel. i. p. 55.*

Dasypus scuto posto nullo, cingulis octodecim. — *Erxleb. Mamm. p. 113.*

Cataphractus scuto unico, cingulis octodecim. — *Briss. Quadr. p. 37.*

TATU MUSTELINUS. — *Ray's Quadr. p. 225.*

LE CIRQUINCON OU TATOU A DIX-HUIT BANDES. — *Buff. Hist. Nat. par Sonn. xxvii. p. 307.*

WEESEL-HEADED ARMADILLO. — *Grew, Mus. Reg. Soc. p. 19. t. 1.*

EIGHTEEN-BANDED ARMADILLO. — *Penn. Hist. Quadr. ii. p. 250. — Shaw's Gen. Zool. i. p. 195, pl. 58.*

HABITAT

in America australi.

W.

This species has a very slender head, and small erect ears. The crust on the shoulders and rump consists of square pieces. There are five toes on each foot. The length, from nose to tail, is about fifteen inches, and that of the tail five and a half. — *Penn. Synops. Quadr. p. 327.*

shield, which is upon the shoulders. It has obtained the name of the *weasel armadillo*, because its head resembles that of the weasel. From Grew's description of this animal, we find that the body was about ten inches long, the head three, and the tail five. The legs were from two to three inches in length; the forehead was large and flat; the eyes were small, and the ears an inch long. It had five toes on each foot, and large claws, of an inch long, on the three middle toes, the others being smaller. The armour of the head, and that of the legs, was composed of round scales, about a quarter of an inch in diameter. The armour of the neck consisted of one piece, formed of small square scales. The shield on the shoulders consisted also of one piece, composed of several rows of similar small square scales. These rows on the shield, in this as well as in all the other species, are continuous, and adhere by a symphysis. The rest of the body, from the shield on the shoulders to the tail, is covered with moveable bands separated from each other by a flexible skin. These bands are eighteen in number. The anterior ones are largest, and composed of small square and oblong pieces; the posterior consist of round and square pieces, and the extremity of the armour, near the tail, is of a parabolic figure. The first half of the tail is covered with six rings, composed of small square pieces; and the second half, as far as the point, is covered with irregular scales. The breast, the belly, and the ears, are naked, as in the other species. Of all the armadillos (from

the moveable bands which extend to the tail) it should appear that this species has the power of contracting and rolling itself up like a ball with the greatest ease.

We have taken this description, as well as Mr. Ray, from Grew. M. Brisson has also followed Mr. Ray, and given a good description of this animal, which he calls simply the *armadillo*. But it is singular, that Linnæus, though he had the descriptions of Grew and Ray before his eyes, should mention this same animal as having but one band*, when it has no less than eighteen. This notion proceeds from a blunder as evident as that of mistaking the *tatu seu armadillo Africanus* of Seba, for the *tatu mustelinus* of Grew, which, even from the description of these authors, are very different animals. It is equally certain, that the animal described by Grew is a real existing species, as the existence of that of Seba, at least as he describes it, is doubtful. In his estimation, this African armadillo has the whole armour of its body divided into three parts†. If this were true, instead of many bands, the back and sides would be covered with one piece bounded by the shields on the shoulders and hump. This passage is the foundation of Linnæus's error, who calls the animal *Dasypus unicinctus, tegmine tripartito*.

All the armadillos are natives of America.

* *Dasypus unicinctus, tegmine tripartito, pedibus pentadactylis.* — *Linn. Syst. Nat.* p. 53.

† *Scutum osseum toto incumbens corpori tripartitum est.* — *Seba, tom. i. p. 47.*

Before the discovery of the New World, they were totally unknown. They are never mentioned by the ancients; modern travellers, uniformly speak of them as animals peculiar to Mexico, Brasil, Guiana &c., and no person ever pretends to have seen any of the species either in Asia or Africa. Some voyagers have indeed confounded the armadillos of America with the manis, or scaly lizard, of the East Indies. Others have imagined that they existed on the west coasts of Africa, because they have sometimes been transported from Brasil to Guinea. Belon *, who wrote more than two centuries ago; and is the first who gave a description and figure of an armadillo, from a skin he had seen in Turkey, tells us, that it came from the New Continent. Oviedo †, De Lery ‡, Go-

* " With regard to the animal I formerly mentioned under the name of *tatou*, it is always brought from Guinea and the New World; and, though it is not taken notice of by the ancients, I have given a figure of it.

" Nature has armed this creature with a hard crust and large scales, like a corslet, by which means the inwards and flesh are easily taken out, without injuring its natural figure. From these circumstances, it may be carried to any distance, and, accordingly, it is not uncommon in our cabinets. It may be called the Brazilian hedgehog; for it retires into its scales, as a hedgehog does into his bristles. It exceeds not the size of a middling pig. It is indeed a species of hog, having the same legs, feet, and muzzle. It has been seen alive in France, and it feeds upon grain and fruits." — *Observ. de Belon*. p. 211.

† Oviedo, *Summarium Ind. Occid.* cap. xxii.

‡ *Hist. d'un Voyage fait en la Terre du Brasil*, par Jean de Lery, p. 154.

mara *, Thevet †, Antoine Herrera ‡, P. d'Abbeville §, François Ximenes, Stadenius ||, Monard ¶, Joseph Acosta **, de Laët ††. and all the modern historians, mention these animals as natives of South America. Of all the writers I have quoted, Piso alone has advanced, but without any authority, that the armadillos are found in the East Indies ††, as well as in America. He has probably confounded the scaly lizards with the armadillos. The former are called *armadillos* by the Spaniards. This error has been adopted by our nomenclators and describers of cabinets, who have not only admitted the armadillos into the East Indies, but into Africa, though none of them ever existed in those parts of the world, except such as were transported from America.

The climate and country of these animals, therefore, are not equivocal: but it is more

* Gomara.—Hist. Mexican, &c.

† Singularités de la France Antarctique. par Thevet, chap. liv.

‡ Descript. des Indes Occident. par Ant. Herrera, p. 252.

§ Mission en l'Isle de Maragnon, par le P. C. d'Abbeville, Capucin, p. 248.

|| Joann Staden. Res gestæ in Brasilia, &c.

¶ Nicolai Monardi, Simplicium Medic. Hist. p. 330.

** Hist. Nat. des Indes, par Joseph Acosta, p. 198.

†† Descript. des Indes Occident. par Jean Laët, chap. v. p. 485 et 486; et chap. xv. p. 556.

‡‡ Cum in Occidentalis non solum, sed et Orientalis Indiæ partibus frequens adeo sit hoc inusitatæ conformationis animal, non mirum si vel nomine, vel magnitudine, figura quoque subinde variet. — *Pison. Hist. Nat. Brasil.* p. 100.

difficult to determine the size of each kind. With this view, we have compared the skins of a great number preserved in the royal and other cabinets: we have also compared all the descriptions of authors with our own, without being able to draw any certain conclusion. It only appears, that the twelve and six-banded armadillos are the largest, and that the three, eight, nine, and eighteen-banded species are the least. The head of the larger kinds is more solid and harder than that of the smaller; the pieces of which it is composed are larger and fewer in number; the moveable bands encroach less upon each other; and the skin and flesh are harder, and not so good. Piso says, that the flesh of the six-banded armadillo is not eatable*; and Nieremberg assures us that it is noxious†. Barrere tells us, that the twelve-banded armadillo has a strong odour of musk. All authors agree, that the flesh of the three-banded, and particularly that of the eight-banded species, is as good as that of a pig. They likewise remark, that all the small kinds frequent the plains and marshes; and that the largest species are found in dry and elevated places only ‡.

* Prima et maxima (*species*) tatupeba, cujus descriptioni supersedeo, utpote non edulis. — *Pison. Hist. Nat. Brasil.* p. 100.

† Quædam innoxia et gratissimi alimenti sunt, alia noxia et venenata, ut vomitu ac flatu alvi sincopem inducant. — Distinguuntur testarum seu laminarum numero: innoxia octonis, noxia senis constant. — *Nieremberg, Hist. Nat. Peregr.* p. 59.

‡ In the woods of Oronoko and Guiana, there are armadil-

68 THE EIGHTEEN-BANDED ARMADILLO.

All these animals have the faculty of contracting their bodies in the form of a ball with more or less facility. When contracted, the defect of their armour is most conspicuous in those which have fewest moveable bands. In this situation, the three-banded species presents two large voids between the shields and the armour of the back. None of them can assume a form so perfectly round as the hedgehog; they have rather the figure of a globe very much flattened at the poles.

The singular crust with which they are covered is a real bone, composed of small contiguous pieces, which, without being moveable or articulated, except at the joints of the bands, are united by a symphysis, and may all be separated from each other when heated in a fire. When the animal is alive, these small pieces, both in the shields and moveable bands*, obey, in some measure, its motions, especially that by which it contracts itself. If this were not the case, it would not possibly roll itself up. These pieces are of different figures in different species, and are always arranged with as much regularity as the most elegant mosaic work.

los four times larger than those of the plains. — *Hist. Nat. de l'Orénoque*, par Gumilla, tom. ii. p. 7.

* “The nine-banded armadillo is very sensible. When his scales are pressed, he complains and rolls himself up like a ball. I remarked, that all the rows, beside the movement by which they joint into each other, have another along the spine of the back, which enables them to extend and enlarge themselves,” &c. — *Nouv. Voy. aux Isles de l'Amerique*, tom. ii. p. 388.

The thin pellicle which covers the crust, is a transparent skin, which has the effect of a varnish to the whole body. This skin rises a good deal, and even changes the reliefs of the mosaic work, which are very different when it is removed. Besides, this osseous crust is only a cover, totally independent of the internal parts of the animal's body, whose bones, and other organs, are constructed like those of all other quadrupeds.

The armadillos, in general, are inoffensive animals, and do no mischief, unless they are allowed to enter the gardens, where they eat melons, potatoes, and other roots and pot-herbs. Though natives of the warm climates of America, they can live in temperate regions. Some years ago, I saw one in Languedoc, which was fed in the house, and went about freely without doing any harm. They walk quickly; but they can neither run, nor leap, nor climb trees; so that they can never escape those who pursue them. Their only resources are to conceal themselves in their holes, or, if too distant from their retreats, to endeavour to dig a hole before they are seized; for the mole digs not more quickly than the armadillo. Before being totally concealed, they are sometimes caught by the tail, when they make such a powerful resistance *, that the tail

* The nine-banded armadillos, when their head and part of the body are concealed in the hole, believe themselves to be safe; and indeed, they have nothing to fear, unless the following expedient be used to drag them out. The Indian

is left in the hands of the enemy. To prevent mutilating them in this manner, it is necessary to widen the holes, and then they are taken without resistance. Whenever they are seized, they roll themselves up, and never extend till they are placed near a fire. Their crust, though hard and rigid, is so sensible, that, when touched by the finger, the animal feels the impression, and instantly contracts itself. When their holes are deep, they are forced out by smoke or by water. They are said to remain in their holes during a third part of the year *. It is certain, however, that they never come out but during the night, when they go in quest of food. The armadillo is hunted with small dogs †, by whom they are soon overtaken. They contract themselves long before the dogs come up with them; and in this state they are seized and carried off. When on the top of a precipice, they escape both the dogs and the hunter; for they contract, and allow themselves to roll down like a bullet ‡,

arrives, and seizes the animal by the tail, which is very long. The armadillo opens his scales, and attaches them so strongly to the walls of his hole, that the Indian may pull off the tail, but cannot force the animal from his retreat. In this case, the hunter tickles him with a stick or the end of his bow, which makes the animal contract his scales, and then he is taken without difficulty. — *Hist. Nat. de l'Orénoque, par Gummilla*, tom. iii. p. 226.

* *Hist. Gen. des Antilles, par le Père du Tertre*, tom. ii. p. 298.

† *Hist. Nat. des Antilles*, p. 123.

‡ *Hernandes, Hist. Mex.* p. 314.

without breaking their crust, or receiving any injury.

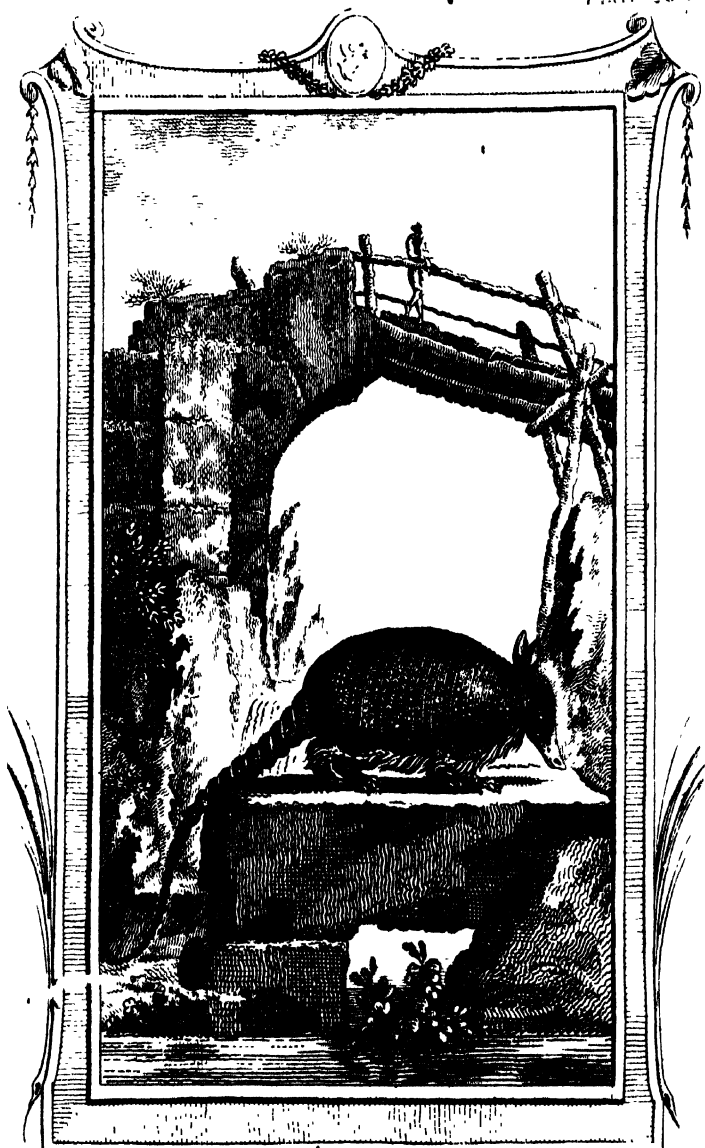
These animals are fat, and very fruitful. The male exhibits, by his external organs, great generative powers. The female is said to produce every four months * ; and, accordingly, the species is very numerous. As they are excellent food, they are hunted in every manner. They are easily taken with snares, that are laid on the edges of waters and other moist places, which they always frequent. They never remove far from their holes, which are very deep, and which they endeavour to regain upon every alarm. They are said not to be afraid of the bite of the rattle-snake †, though it is as dangerous as that of the viper. It is said that they live in peace with these reptiles, which are often found in their holes. The savages employ the crust of the armadillo for several purposes. They paint it with different colours, and make of it baskets, boxes, and other small vessels. Monard, Ximenes, and other writers, ascribe great medicinal powers to different parts of these animals. They assure us that the crust reduced to a powder, and taken internally, even in a small dose, is a powerful sudorific; that the hip-bone, pulverized, cures the venereal disease; that the first bone of the tail, applied to the ear, restores hearing to the deaf, &c. We can give no credit to these ex-

* Histoire Naturelle de l'Orénoque, par Gumilla, p. 225.

† Nieremberg, Hist. Nat. Peregr. p. 159.

72 THE EIGHTEEN-BANDED ARMADILLO.

traordinary powers. The crust and bones of the armadillo are of the same nature with the bones of other animals. Effects so marvellous can only be produced by imaginary virtues.



W. B. C. v. p.!

LONG TAILED ARMADILLO.

THE LONG-TAILED ARMA- DILLO.

WE have given a figure of an armadillo with nine moveable bands and a very long tail. Dr. William Watson has described this armadillo*, of which the following is an extract. This animal was living in the house of lord Southwell, and was brought from America. The figure, however, in the Philosophical Transactions, was not drawn till after the animal's death, which is the reason why it is rough and hard, as it is in our figure. This animal weighed seven pounds, and exceeded not the size of an ordinary cat. It was a male, and grew considerably while in lord Southwell's possession. It was fed with flesh and milk, and refused to eat grain or fruits. Those who brought it from America assured us, that it dug a lodgment for itself in the earth †.

~~description of the nine-banded armadillo, and it is rather extraordinary that he should not have referred it to that species.~~

THE PACA, OR SPOTTED CAVY*.

THE paca, or spotted cavy, is an animal peculiar to the New World. It digs holes in the earth, like the rabbit, to which it has often been

* CHARACTER SPECIFICUS.

CAVIA PACA. C. caudata, pedibus pentadactylis, lateribus flavescente-lineatis.—*Linn. Syst. Nat. Gmel.* i. p. 120. — *Erxleb. Mamm.* p. 356. — *Schreb.* iv. p. 609, pl. 171.

MUS PACA. M. cauda abbreviata, pedibus pentadactylis, lateribus flavescente-lineatis.—*Syst. Nat. edit.* 12, i, p. 81.

Cuniculus (Paca) caudatus, acutus, pilis obscura fulvis rigidis, lineis ex albo flavescantibus ad latera distinctus.—*Bris. Quadr.* p. 144.

Mus Brasiliensis magnus porcelli pilis et voce paca dictus.



ПАСА.

compared, though there is very little resemblance between them. It is even larger than the hare. Its body is thicker and plumper; the head is round and the muzzle short. It is very fat, and rather resembles a young pig* in figure, grunting, gait, and manner of eating; for it uses not, like the rabbit, its fore-feet in carrying food to its mouth; and, like the hog, it digs the earth in quest of nourishment. It frequents the banks of rivers†, and is only found in the warm and moist places of South America. Its flesh is fat, and is excellent food‡. Even its

is a dark brown; the sides are marked, lengthways, with lines of gray spots. The belly is white; in some, perhaps young ones, the sides and spots are of a pale yellow. There are five toes on each foot. It has only the mere rudiment of a tail. The length of the body is about ten inches. It is made like a pig, and in some places is called the hog-rabbit.—*Penn. Synops. Quadr.* p. 245.

* Hoc genus animalia pilis et voce porcellum referunt, dentibus et figura capitis, et etiam magnitudine cuniculum; auribus murem; suntque singularia et sui generis. — *Raii Synops. Quadr.* p. 227. Mr. Ray might have added, that this animal resembles a pig still more in the figure of its body, in the taste and whiteness of its flesh, in fatness, and the thickness of its skin; and that it is larger than any rabbit.

† The pacas resemble pigs of two months old; and are very numerous about the banks of the river *S. Francisco*. — *Descript. des Indes Occident. par de Laët*, p. 484.

‡ The pac is the fattest of all our Cayenne animals, and its flesh is extremely good and well flavoured. — *Voyage au Cayenne, par Ant. Binet.* p. 340. The pak is a well known species of rabbit; its flesh is much better than that of the agouti, or long-nosed cavy. — *Barrère, Hist. Franc. Equin.* p. 185. The pacas of Brasil are large; their head and muzzle

skin is eat*, like that of a pig. For these reasons, this animal is in perpetual request. It is difficult for the hunters to take him alive. When surprised in his hole, which they lay open both before and behind, he defends himself, and even bites in a cruel manner. His skin, though covered with coarse short hair, makes a very good fur †, because it is regularly spotted on the sides.

resemble those of cats; their skin is of a dull gray colour, spotted with white. Their flesh is very good and tender.—*Descript. des Indes Occident. par Herrera, p. 252.*

* The muzzle of the *paca* is round, like that of a cat: its skin is black, and marked with some white spots. Not only the flesh, but the skin is delicious, tender, and in great request with the luxurious.—*Hist. des Indes, par Maffée, p. 70.* *Paca* magnitudine est porcelli, pingui et crasso corpore, et circiter decem digitos longo: capite instar cuniculorum nostrorum crasso; auribus pilis nudis et paulum acutis: nares habet amplas; os inferius brevius superiori: rimam instar leporis, non tamen fissura; barbam felinam, seu leporinam prolixam, et post oculos pone aures iterum tales pilos: crura priora paulo breviora posterioribus; in pedibus digiti *quatuor*: cauda brevissimo ut *Aguti*; pili corporis sunt umbræ coloris, breves, et ad tactum duri. In lateribus autem secundum longitudinem maculas habet cinereas, in ventre albicat. Cibum oblatum pedibus non tenet ut *Aguti*, sed in terra positum devorat, instar suis, atque ad eundem pene modum grunnit. Carnem habet eximiam et pinguem, ita ut non habeat opus lardo quando assatur, unde Lusitanis *caca real* vocatur illorum venatio.—*Marcgr. Hist. Brasil. p. 224.* Note, Marcgrave errs when he gives this animal four toes only to each foot; for it is certain that there are five toes on all the feet; the inmost is, indeed, so small as to be distinguishable by the claw only.

† The *pag*, or *pague*, is an animal about the size of a small spaniel. Its head is of a clumsy make; its flesh has nearly the same taste as that of veal; and its skin, being beautifully

These animals produce often, and in great numbers; many of them are destroyed by men and beasts of prey; and yet the species is always numerous. It is a native of South America, and is found in no part of the Old Continent*.

The above description of the spotted cavy was taken from a young subject, which had not acquired one half of its growth. I have since had one sent me, which, when it arrived, was larger than the former; and, from the month of August 1774, to the 28th day of May 1775, during which period it was nourished in my house, its size continued to augment. I now proceed to give an account of its mode of living and acting, from the remarks of the Sieur Trécourt.

When provided with a wooden cage or box, this animal remains perfectly tranquil during the day, especially when plentifully supplied with food. He seems even to have an affection for

spotted with white, gray, and black, makes very rich fur. — *Hist. d'un Voyage au Brasil, par de Lery, p. 157.*

At Maragnon we find animals called *pacs*; which are round, and somewhat larger than the *coatis*. Their head is thick and short, their ears small, and their tail not longer than a little finger. Their skin is beautiful, being covered with short hair, variegated with black and white spots. — *Mission au Maragnon, par le P. Claude d'Abbeville, p. 25*

* Pennant says that these animals are discovered by little dogs, who point out the places they lie in: the master digs over them, and when he comes within reach, transfixes them with a knife, otherwise they are apt to escape.

He refers to De Laet's *Amer.* p. 484, for a variety quite white, found on the banks of the river St. Francis.

his retreat, as long as the day lasts; for, after feeding, he retires spontaneously into it. But, when night approaches, by perpetual restlessness and agitation, and by tearing the bars of his prison with his teeth, he discovers a violent desire to get out. Nothing of this kind happens during the day, unless he has occasion for some natural evacuation; for he cannot endure the smallest degree of dirtiness in his little apartment; and, when about to void his excrements, he always retires to the most distant corner he can find. When his straw begins to smell, he often throws it out, as if he meant to demand fresh litter. This old straw he pushes out with his muzzle, and goes in quest of rags or paper to replace it. But his attachment was not confined to his cage. All obscure corners seemed to be agreeable to him; and he often formed a new nest for himself in presses which he found open, or under the kitchen grate. Wherever he established a new abode, nothing but force could make him leave it. In this animal, which was a female, the propensity to cleanliness was so strong, that, a large male rabbit being shut up with her when she was in season, she took an aversion to him the moment he voided his excrement in their common apartment. Before this event, she had received him so cordially, that something was expected; she even made considerable advances, for she licked his nose, ears, and body; and she allowed him to take almost the whole food which was given her. But, as soon as the rabbit had infected the cage with his

ordure, she retired into the bottom of an old press, where she made a bed of paper and rags, and returned not to her old lodging till she saw it neat, and freed from the unclean guest which had been presented to her.

The spotted cavy is easily accustomed to a domestic life. Unless industriously irritated, he is gentle and tractable. He is fond of adulation, and licks the hands of the person who caresses him. He knows those who take care of him, and readily distinguishes their voices. When gently stroaked on the back, he stretches himself out, lies down on his belly, by a small cry expresses his acknowledgment, and seems to ask a continuance of the favour. When seized in a rough manner, however, he makes violent efforts to escape.

His muscles are large and strong; and yet his skin is so sensible, that the slightest touch is sufficient to excite in him the most lively emotions. This great sensibility, though generally accompanied with sweetness of temper, produces sometimes, when too much irritated, or when a disagreeable object is presented, the most violent paroxysms of passion. The bare sight of an unknown dog is sufficient to produce this effect in the spotted cavy. When confined in his cage, he has been observed, upon the entrance of a strange dog into the chamber, to bite the door, and make an effort to force it. At first, it was believed that he never wished to go out, unless when pressed by natural necessities. But, when at full liberty, we were surprised to see him dart

out suddenly upon an innocent dog, which he bit very severely. In a few days, however, he became familiar with this dog. People with whom he is unacquainted, if they irritate him, he treats in the same manner. But he never bites those who have the care of him. He has an aversion to children, whom he always pursues. His passion is expressed by chattering his teeth, and is always preceded by a kind of grunting.

This animal sits often on his posteriors, and sometimes remains long in this situation. He has the air of combing his head and whiskers with his paws, which he continually licks and moistens with his saliva. In this operation, he often uses both paws at a time; he then scratches all the parts of his body which he can reach with his fore-feet, and completes his dressing by scratching with his hind paws such parts as cannot be reached by the fore ones.

The spotted cavy, notwithstanding, is gross and corpulent. His body is neither delicate, nor smooth nor nimble, but rather heavy and lurid, having nearly the gait of a small hog. He runs seldom, and, when he does, it is always with a bad grace. He has no vivacious movement, but that of leaping upon the furniture, or upon such things as he wishes to seize and carry off. He resembles the hog still farther in the whiteness and thickness of his skin, which cannot be drawn off, because it adheres to the flesh.

Though our animal had not acquired his full growth, he was eighteen inches long in his na-

tural contracted situation; but, when he extended himself, he was near two feet from the point of the muzzle to the extremity of the body; while the spotted cavy, described in the original work, exceeded not seven inches five lines; which difference, as there was no other between the two animals, must be ascribed entirely to that of their ages.

The height before, in the individual we are now describing, is seven inches, and behind about nine inches and a half; so that, in walking, the hind part of the body appeared always higher than the head. The posterior part of the body is also the thickest, being nineteen inches and a half in circumference, while that of the anterior part is only fourteen inches.

The body is covered with short, coarse, thinly scattered hairs, of a dusky colour, and deeper on the back. But the belly, the breast, the throat, and the interior parts of the legs, are of a dirty white. This animal is rendered exceedingly remarkable, by five longitudinal rows of white spots, which run along the body, and approach each other at their extremities.

The head, from the nose to the top of the front, is near five inches long, and very convex. The eyes are large, prominent, of a brownish colour, and about two inches distant from one another. The ears are roundish, about eight lines in length, and nearly of an equal breadth at the base; they are plaited, and covered with a down so fine as to be almost imperceptible

either to the touch or the sight. The end of the nose is broad, nearly of a black colour, and divided like that of the hare. The nostrils are very large. The animal has considerable strength and address in the management of this organ; for I have often seen him raise the portcullis of his cage with it. The under jaw is an inch shorter, and much narrower than the upper. On each side, and toward the base of the upper jaw, there is a kind of longitudinal fold, garnished with hair on the middle, which, at first sight, especially when viewed sideways, may be mistaken for the mouth; for the mouth appears not, unless when it is open; its aperture exceeds not six or seven lines; and it is not above two or three lines distant from the fold mentioned above.

Each jaw is armed with two very long incisive teeth, which are as yellow as saffron, and of strength sufficient to cut wood. I have seen this animal, in the course of a single night, cut a hole in one of the planks of his lodging large enough to let out his head. His tongue is narrow, thick, and somewhat rough. His whiskers consist of black and white hairs, placed on each side of the nose; and there are similar hairs, but blacker and fewer in number, on each side of the head under the ears. The resistance of the animal prevented us from counting the number of its grinders.

Each foot, both before and behind, has five toes, four of which are armed with claws about

half an inch long, and of a flesh colour. But this colour should not be regarded as a constant character; for, in several animals, and particularly the hare, we often find the claws black, while, in other individuals, they are whitish or flesh-coloured. The fifth, or interior claw, is very short, and visible only when the animal raises his foot. Between the hind-feet, at a little distance from the organs of generation, there are two paps of a brownish colour. In fine, though the tail is hardly visible, by searching, we find a small button of two or three lines long.

The domestic paca, or spotted cavy, eats every thing presented to him, and has a strong appetite. He is commonly fed with bread, which he eats equally well, whether it be soaked in water, in wine, or even in vinegar. But he is so fond of sugar and fruits, that, when offered to him, he expresses his joy by bounding and leaping. He is also fond of roots and pot-herbs of all kinds; for he eats, with equal relish, grapes, cellery, onions, and garlic; and he refuses not coleworts, grass, moss, or the bark of trees. We have even seen him eat wood, though half charred. Flesh he seemed to like worse than any other food, and he eat it but rarely, and in very small quantities. He might be easily fed with grain; for he often searched for it among his litter. When he drinks, he laps like the dog. His urine is thick, and has an insupportable odour. His excrements consist of small crotchels.

which are longer than those of the rabbit or hare.

From these minute observations, we are led to believe that this species might be naturalized in France, which, as the animal is easily tamed, and his flesh is excellent, would be a useful acquisition. He seems not to be much afraid of cold; and, besides, as he can dig holes in the earth, he could easily defend himself against the rigour of winter. A single individual of this species would furnish as much good meat as seven or eight rabbits.

M. de la Borde informs us that the spotted cavy generally lives on the banks of rivers; and that he forms his hole in such a manner as to have three different ways of entering, or going out. "When pursued," M. de la Borde remarks, "he takes to the water, and dives frequently; but, when attacked by the dogs, he makes a vigorous defence." M. de la Borde adds, "that the flesh of this animal is much esteemed at Cayenne, and that, however prepared, it is excellent.

"The spotted cavy lives alone in his hole, and leaves it not till night, when he goes in quest of food. He comes not abroad during the day, unless when he is obliged by the necessities of Nature; for no dung is ever found in his kennel; and, when he returns, he always shuts up the entrances with leaves and twigs. The female generally produces but one at a time, which quits not the mother till it be full grown, or, if

it be a male, till it copulates. At Cayenne, there are two or three species, which are said not to intermix. Some of them weigh from fourteen to twenty pounds, and others from twenty-five to thirty."

THE VIRGINIAN OPOSSUM*.

THE opossum is an American animal, and easily distinguishable from all others, by two very singular characters. 1. Under the belly of

* DIDELPHIS.

CHARACTER GENERICUS.

Dentes primores superiores decem. Inferiores octo: inter-
mediis duobus brevissimis.

Laniarii longi, plures.

Molares denticulati.

Lingua subciliata.

Plantæ manus, pollice mutico.

Cauda longa, gracilis, subnuda.

CHARACTER SPECIFICUS.

DIDELPHIS OPOSSUM. D. cauda semipilosa, superciliorum
regione pallidiora. — *Lin. Sys. Nat. Gmel. i. p. 105.* —
Schreb. iii. p. 537, pl. 146, A. I.

DIDELPHIS MARSUPIALIS. D. mamma intra folliculum
abdominalem. — *Erstb. Mus. p. 79.*

Philander saturate spadicea in dorso, in ventre flavus,
maculis supra oculos flavis. — *Bris. Regn. An. p. 286.*

Carigueya Brasiliensibus, aliquibus Jupatüma. — *Marcgr.*
Bras. p. 222, cum fig. mediocri (femina.)

TAT-IBI BRASILIENSIBUS. — *Marcgr. Bras. p. 223.* — (mas.)
Jonst. Quadr. p. 135, t. 63.



VIRGINIAN OPOSSUM.



FEMALE VIRGINIAN OPOSSUM.

the female there is a large cavity, in which she receives and suckles her young. 2. In both male and female, the first toe of the hind-feet has

PHILANDER. — *Seb. Mus.* i. p. 56, 57, t. 36, f. 1, 2, 3.

SIMIVULPA. — *Gesn. Quadr.* 870. — *Aldrov. dig.* 223.

CARIGUEIA. — *Tyson, Phil. Trans.* No. 239, p. 105. — *Cowper, ibid.* No. 290, p. 1565.

TLAQUATZIN. — *Hernand. Hist. Mex.* p. 330.

LE SARIGUE OU L'OPOSSUM. — *Buff. Hist. Nat. par Sonn.* xxviii. p. 5, pl. 1.

LE RAT DE BOIS. — *Du Pratz, ii.* p. 94, cum fig. meridiori.

THE POSSUM. — *Lawson. Carolin.* p. 120.

OPOSSUM. — *Catesb. Carol.* p. 120.

MOLUCCA OPOSSUM. — *Penn. Hist. Quadr. ii.* p. 20. — *Shaw's Gen. Zool. ii.* p. 467, pl. 108.

HABITAT

in Americæ calida et temperiori parte; etiam in insulis Antillis, Philippinis, et Moluccis.

M. de Buffon seems not to be acquainted with the Virginian opossum, but has compiled an account of its manners, and collected the synonyms of it. The figures which he has given belong to the Molucca opossum, as does the description. — *Penn. Hist. Quadr. ii.* p. 20.

The species of opossum seem to have been involved by the writers in natural history, in a degree of obscurity from which they can only be rescued by strict attention to their particular characters. W.

The Virginian opossum has a long sharp pointed nose; large, round, naked, and very thin ears; small, black, lively eyes; and long stiff hairs on each side of the nose, and behind the eyes. The face is covered with short soft hairs, of a dusky colour. Above each eye, there is a large white spot. The cheeks are whitish, and the sides of the neck of a dirty yellow. The hind part of the neck, and the back,

no claws, and is separated from the rest, like the thumb in the human hand; while the other toes of the same feet are placed near each other, and armed with crooked claws. The first character has been remarked by some travellers and naturalists; but the second has entirely escaped them. It was first observed by Edward Tyson, an English physician. He is the only author who has given a good description of the female*; and, a few years after, Mr. Cowper, a celebrated English anatomist communicated to Tyson the observations he had made upon the male. Other authors, and particularly the nomenclators, who perpetually multiply species without necessity, have committed a number of blunders with regard to this animal, which we must endeavour to correct.

are covered with soft but uneven hairs, above two inches long, the bottoms of which are of a yellowish white, the middle part black, and the ends whitish. The sides are covered with dirty and dusky hairs, and the belly with soft, woolly, dirty white hair. The legs and thighs are black, the feet dusky, and the claws white. The base of the tail, for near three inches, is clothed with long hairs like those on the back, and the remainder with small scales; the half next the body is black, and the rest white. The tail has a disagreeable appearance, resembling the body of a snake, and has the same prehensile power as that of some monkeys. The body is round, and pretty thick, and the legs are short. The female, on the lower part of the belly, has a large pouch, in which the teats are lodged, and where the young shelter as soon as they are born. The length of one I examined was seventeen inches, and that of the tail fourteen.

Penn. Synops. Quadr. p. 205.

* *The Anatomy of an Opossum*, London, 1698.

Our opossum is the same animal with the great oriental philander of Seba*; for, of all the animals of which Seba has given figures, and to which he applies the names of *philander*, *opossum*, or *carigüeya*, this alone has the two characters of a pouch under the belly, and thumbs without claws on the hind-feet. Neither is the opossum an eastern animal, but a native of the warm climates of the New World; for the two we have in the Royal Cabinet were brought from America. That of Tyson was sent to him from Virginia. M. de Chanvallon, a correspondent of the Academy of Sciences at Martinico, who gave us a young opossum, recognised the other two to be real American opossums. It is agreed by all voyagers, that this animal is found in Brasil, New Spain, Virginia, the Antilles, &c., and none of them ever mention their having seen it in the East Indies. Hence Seba deceives himself, when he calls them the *oriental philanders*. He says, that his philander was sent him from Amboina, along with other curiosities, under the name of *coes-coes*; but he allows, at the same time, that it had been brought to Amboina from some other remote country†. This confession is alone sufficient to throw a suspicion on the denomination of *oriental philander*; for it is very probable that travellers may have transported

* Seba, tom. i. p. 64, tab. 39.

† Philander maximus orientalis fœmina. Inter alia rariora et hocce animal nobis ex Amboina missum est, sub nomine *cos-coes*, eo equidem delatum EX ORIS REMOTIORIBUS. — Seba, vol. i. p. 64.

this animal from America to the East Indies; but we have no proof of its being a native of Amboina; and the very passage quoted from Seba seems to indicate the contrary. The source of this error, in fact, as well as that of the name *coes-coes*, is to be ascribed to Piso, who says*, that, in Amboina, there is an animal, similar to the Brazilian opossum, which is called *cous-cous*. Piso mentions no authority for this assertion. It would be very singular, if it were true, that this animal is found in Amboina, and in no other part of the East Indies. Seba, on the contrary, remarks, that the one sent to him from Amboina was not a native of that place, but had been transported from a more distant country. But, though he was ignorant of the region from which his philander was brought, he has presumed to give it the epithet of *oriental*. It is unquestionably, however, the same animal, as will appear from comparing his figure, tab. 39, with Nature. But what augments this error, at the same time that the author gives to the American opossum the name of *the great oriental philander*, he exhibits to us another animal, which he believes to be different from the former, and calls it the *American philander*†; and yet, from his own description, it differs from the great oriental

* In Indiis Orientalibus, IDQUE SOLEM, QUANTUM HACTENUS CONSTAT, IN AMBOINA similis bestia frequens, ad felis magnitudinem accedens; mactata ab incolis comeditur, si rite præparetur, nam alias fortet. Nomen illi *cous-cous* inditum. — *Pison. Hist. Nat. Brasil.* p. 323.

† Seba, tab. 36, fig. 1 and 2.

philander only in being smaller, and in having the spots above the eyes of a browner colour. These differences are too slight and too accidental to constitute distinct species; for he takes no notice of another difference, which, if it had any existence, would be much more essential, namely, that this American philander of Seba* has a sharp claw upon the thumbs of the hind-feet, while his great oriental philander has no claws on these thumbs†. Now, it is certain, that our opossum, which is the true American one, has no claws on the hind thumbs. If any animal, therefore, with sharp claws on these thumbs, existed, like that represented by Seba in his 36th table, it could not, as he maintains, be the American opossum. But this is not all: Seba gives a third animal under the name of the *oriental philander*‡; of which, however, he makes no mention in his descriptions of the other two, but follows François Valentin, an author, as formerly remarked, who merits no confidence. This third animal is still the same with the two first. Hence it appears, that the three figures in Seba's 36th, 38th, and 39th tables, are one and the same animal; and it is probable, that the drawer, from inattention, has given sharp claws to the hind as well as to the fore thumbs, as in tables 36th and 38th, and that, being more exact in table 39th, he has represented the thumbs of the hind-feet, as they really are, without claws. We

* Seba, tab. 36, fig. 1 and 2.

† Ibid. tab. 39.

‡ Ibid. tab. 33, fig. 1.

are therefore persuaded that these three animals of Seba are only individuals of the same species, which is the same with that of our opossum, and that the slight differences in size and colour, mentioned above, proceed from age or from accident. The author himself allows, that the two animals in his 36th and 38th tables, differ only in size and some shades of colour*; and that the third, table 39th, differs from the two former in being larger only, and having the spots above the eyes, instead of yellowish, of a brown colour. Seba remarks, "That, according to Francis Valentin, the philander, table 38th, is the largest kind found in the East Indies, and especially among the Mallays, where it is called *pelandor Aroé*, that is, *the rabbit of Aroé*, though Aroé is not the only place where these animals are to be met with; that they are common in the island of Solor; that they are reared along with the rabbits, to whom they do no harm; that their flesh, which is excellent, is eaten by the inhabitants," &c. These facts are extremely questionable, not to say false. 1. The philander, table 38th, is not the largest East India kind; for, according to our author, that represented in table 39th, which he likewise attributes to the East Indies, is larger. 2. This philander has no resemblance to the rabbit; and, consequently, is improperly called *the rabbit of Aroé*. 3. No voyager to the

* Est autem femella hæcce Americanis Philandris FEMINIS QUAM SIMILLIMA; nisi quod pilis dorsalibus aliquantum saturatius fuscis vestita, et toto habitu procerior sit illis.—*Seba*, vol. i. p. 61.

East Indies makes mention of this remarkable animal; neither is it found in any other part of the Old Continent. * Seba himself seems to perceive not only the incapacity, but the unfaithfulness of the author he quotes: "Cujus equidem rei," says he, "fides sit penes autorem. At miram tamen est, quod D. Valentinus philandri formam haud ita descripserit prout se habet, et uti nos icones ad vivum factas prægressis tabulis exhibuimus*." But, to give a complete demonstration of the little credit due to the testimony of Francis Valentin, who has written a history of the East Indies in five folio volumes †, it is sufficient to refer to what is said of him by Artedi ‡, and to the reproaches thrown upon his veracity by Seba himself §. Valentin asserts, "that the pouch of the philander is a uterus, in which the young are conceived; that, after dissecting a female himself, he could find no other; that, if this pouch is not a real uterus, the teats are to the young what the pedicles are to fruits; that they adhere to these teats till they are full

* Seba, tom. i. p. 61.

† Ond ne nieust Oost-Indien, &c, 1724.

‡ Multa scripsit Franciscus Valentinus, quæ Judæus Appella credat. . . . Ita comparatus est hic liber Belgicus, in historicorum naturalium genuinorum et eruditorum oculos nullo modo ferre possit.—*Artedi Ichthyologiæ Hist. Literar.* p. 55 et 56.

§ Inde autem quam liquidissime detegitur error a D. Francisco Valentino commissus, circa historiam horum animalium, tom. iii. p. 273. . . . Error absonus valde et enormis, inde forsân ortum duxit, quod vir iste hanc animalium speciem haud debite examinaverit, &c.—*Seba*, vol. i. p. 64.

grown, and then separate as the fruit from the pedicle, after it arrives at maturity," &c. The truth is, that Valentin, who assures us that these animals are extremely common in the East Indies, and particularly in the island of Solor, had never seen one of them in that country; that all he has said, including his most conspicuous errors, he has copied from Piso and Marcgrave, who both copied from Ximenes, and are wrong in every article they have added of their own; for Marcgrave and Piso, as well as Valentin, assert, in the most positive tone, that the pouch is the true uterus*, where the young opossums are conceived. Marcgrave says, that he dissected a female, and found no other uterus. Piso goes farther, and tells us, that he dissected several females†, and never could discover any internal uterus; and to this assertion he adds another equally false, that this animal is found in Amboina. Let men now judge what credit is due to Marcgrave, Piso, and Valentin, the first of whom has examined with no attention, the second has augmented the errors of the first, and the third has copied from both.

I ask pardon of my readers for this long critical discussion. But, when errors are to be cor-

* Hæc bursa ipse uterus est animalis, nam alium non habet, uti ex sectione illius comperi: in hac semen concipitur et catuli formantur. — *Marcgr. Hist. Bras.* p. 223.

† Ex REITERATIS horum animalium sectionibus, alium non invenimus uterum præter hanc bursam, in qua semen concipitur et catuli formantur. — *Pison. Hist. Nat. Bras.* p. 323.

fect, we can never be too exact, or too attentive, even to minute circumstances.

M. Brisson, in his account of quadrupeds, has implicitly adopted what he found in the works of Seba, and follows him both in his denominations and descriptions. He even proceeds a step farther than his author, when he makes three distinct species of the philanders, represented in tab. 36, 38, and 39, of Seba; for if M. Brisson had examined the idea given by Seba, he would have found, that the latter does not exhibit his philanders as three distinct species. Seba never doubted that an animal found in the warm climates of America, would not also be found in the warm regions of Asia. He denominated his animals oriental or American, according as they came to him from the one or the other continent. It is obvious, from the following passage, that he does not take the word *species* in a strict sense: "This is the largest *species* of these animals;" page 61. He adds, "This female is perfectly similar to the female philanders of America; it is only longer, and covered on the back with hair of a deeper yellow." These differences, as formerly remarked, are accidental varieties only, which are common among individuals of the same species at different ages; and, in fact, Seba never pretended to make a methodical distribution of animals into classes, genera, and species. He gives only figures of the different specimens in his cabinet, which he distinguishes by numbers, according to any varieties he perceived in their size, the tints of their colours, or the countries

from which he obtained them. It is apparent; therefore, that M. Brisson had no authority for making three species of philanders, especially as he gives no distinctive characters, and makes no mention of the want of claws on the thumbs of the hind-feet. He says, in general, that the philanders have *claws*, without making any exception. The philander, however, which he saw in the Royal Cabinet, had no claws on the thumbs of the hind-feet; and it appears to have been the only one he ever saw; since in his book, there is no more than No. I. marked with two asterisms. The chief error in Brisson's work is in the list of species, which is more numerous than that of Nature.

M. Linnæus is the only other nomenclator we have to examine. In this article, he is less exceptionable than in many others; for he has suppressed one of the three species of Seba*. But he ought to have reduced them to one.

From the preceding examination, which has been made with the most scrupulous impartiality, it appears that the *philander*, *opossum*, seu *carigeya Brasiliensis*, of Seba, tab. 36, fig. 1, 2, and 3, the *philander orientalis maximus*, tab. 39, fig. 1, the oriental philander, No. 2, and the

* The count de Buffon's strictures on the *Systema Naturæ* of Linnæus are adapted to the tenth edition; Buffon's criticisms, of course, have no application to the present state of Linnæus's system. The translator, therefore, thinks it unnecessary to insert them; and, he apprehends, the reader will not think himself injured by the omission.

philander of Amboina, No. 3, of M. Brisson; and, lastly, the *marsupialis*, No. 1, and the *opossum*, No. 3, of Linnæus, are the same animal, and that this animal is our opossum, which is peculiar to South America, and was never seen in the East Indies, except when transported thither. I thought I had cleared up every ambiguity; but still some difficulties remain with regard to the *taïibi*, which Marcgrave* has not represented as an animal different from the *carigueya*; but, nevertheless, Johnston†, Seba‡, Klein§, Linnæus||, and Brisson¶, give it as a species distinct from the preceding. In Marcgrave, however, we find the two names *carigueya* and *taïibi* at the head of the same article, where it is said, that this animal is called *carigueya* in Brasil, and *taïibi* in Paraguay. “*Carigueya Brasiliensibus, aliquibus jupatiima, Petiguaribus taïibi.*” He then gives Ximene’s description of the *carigueya*. After which, we find another animal called *taïibi* by the Brasilians, *cachorro domato* by the Portuguese, and *booschratte*, or *wood-rat*, by the Dutch. Marcgrave says not that this animal is different from the *carigueya*; he represents it, on the contrary, as the male *carigueya*; “*Pedes et digitos habet ut fœmella jam descripta.*” It is obvious, therefore, that,

* Marcgrave, Hist. Nat. Brasil. p. 223.

† Johnston, de Quadruped. p. 95.

‡ Seba, vol. i. p. 57, tab. 36, fig. 4.

§ Klein, de Quadruped. p. 59.

|| Linn. Syst. Nat. edit. 10, p. 54, No. 2.

¶ Brisson, Regn. Anim. p. 290.

in Paraguay, both the male and female opossum are called *taibi*, and that, in Brasil, the name *taibi* is given to the male, and that of *carigueya* to the female. Besides, the differences between these two animals, as they appear even from the descriptions given of them, are too slight to constitute distinct species. The most remarkable difference is in the colour of the hair, which, in the *carigueya*, is yellow and brown, but gray in the *taibi*, whose hairs are white below *, and brown or black at the extremities. It is more than probable, therefore, that the *taibi* is the male opossum. Mr. Ray † seems to be of this opinion; when speaking of the *carigueya* and *taibi*, he says, “An specie, an sexu tantum a præcedente diversum?” Seba, however, notwithstanding the authority of Marcgrave, and the rational doubts of Ray, gives, in tab. 36, fig. 4, the figure of an animal, which, without any hesitation, he calls *taibi*, and, at the same time, says, that it is the same with the *llaquat-zin* of Hernandez. This is to accumulate error upon error; for, from the acknowledgment of Seba himself, his *taibi*, which is a female, has no pouch under the belly ‡, and Hernandez makes this pouch the chief character of his *lla-*

* The hair of the wood-rat is of a fine silver gray colour. Some of them are seen totally white. The female has, under her belly, a purse which she can open and shut at pleasure. — *Charlevoix's Descript. de la Nouv. France*, tom. iii. p. 334.

† Raii Synops. Quad. p. 185.

‡ Marsupio tamen pro recondendis catulis caret hæc species. — *Seba*, tom. i. p. 58.

quatzin. The taiibi of Seba, therefore, cannot be the tlaquatzin of Hernandez, because it wants the pouch, nor the taiibi of Marcgrave, because it is a female. It is certainly another animal, ill drawn, and worse described, to which Seba has thought proper to give the name of *taiibi*, and absurdly refers it to the tlaquatzin of Hernandez, which, as formerly remarked, is the same with our opossum. Brisson and Linnæus, with regard to the taiibi, have blindly followed Seba. They have both copied Hernandez's blunder as to the tlaquatzin, and made an equivocal species of this animal, the one under the name of the *Brasilian philander* *, and the other under that of *philander* †. The true taiibi of Marcgrave and Ray, therefore, is neither the taiibi of Seba, nor the philander of Linnæus, nor the Brasilian philander of Brisson; and the two latter are not the tlaquatzin of Hernandez. The taiibi of Seba, if it had any existence, would be an animal different from all those mentioned by the above authors, and would require a new denomination: In fine, as the male opossum has no pouch, it is not surprising that the male and female have been considered as different animals, and that the female has got the name of the *carigüeya*, and the male that of the *taiibi*.

Edward Tyson dissected and described the female opossum with great accuracy. In his

* *Philander pilis in exortu albis, in extremitate nigricantibus vestita.* . . . *Philander Brasiliensis.*—*Regn Anim.* p. 290.

† *Didelphis philander, cauda basi pilosa, auriculis pendulis, mammis quaternis.*—*Syst. Nat.* p. 72.

individual, the head was six inches long, the body thirteen, and the tail twelve. The fore-legs were six inches in length, and the hind-legs four inches and a half. The circumference of the body was from fifteen to sixteen inches; and that of the tail, at its origin, three inches, and only one toward the extremity. The head across the eyes was three inches broad, gradually diminished to the nose, and resembled the head of a pig more than that of a fox. The orbits of the eyes were much inclined in the direction from the ears to the nose. The ears were rounded, and about an inch and a half long. The aperture of the mouth was two inches and a half, measuring from one of the angles of the lips to the end of the muzzle. The tongue was pretty narrow, three inches long, rough, and full of small papillæ directed backward. There were five toes on the fore-feet, all armed with crooked claws, and an equal number on the hind-feet, four of which only had claws, and the fifth, which is the thumb, was separated from the rest, placed in a lower situation, and had no claw. There was no hair on the claws, which were covered with a reddish skin, and nearly an inch in length. The palm of the hands and feet was large, and there were fleshy callosities under all the toes. The tail was covered, for two or three inches from its origin, with hair, and afterwards, to the end, with a smooth scaly skin. The scales were whitish, nearly hexagonal, and regularly placed, so as not to encroach on each other, being all separated by a small circle of skin, which was of a

browner colour than the scales. The ears were naked, thin, and membranous, like the wings of a bat; they were also very open, and the auditory canal was large. The upper jaw was a little longer than the under. The nostrils were large, the eyes small, black, prominent, and lively. The neck was short, the chest broad, and the whiskers like those of the cat. The hair on the fore part of the head was whiter and shorter than that on the body: the back and sides were ash-coloured, mixed with some small tufts of black and whitish hairs; the belly was browner, and the legs more dusky. Under the belly of the female, there was an aperture about two or three inches long, formed by two folds of skin, which composed a pouch thinly covered with hair internally. This pouch contained the teats. The young, as soon as brought forth, go into this pouch in order to suck the mother, and acquire so strong a habit of concealing themselves, that, after arriving at a considerable size, they continue to take refuge in the pouch, whenever they are alarmed. This pouch the animal can open or shut at pleasure, which it performs by means of several muscles, and two bones, that are peculiar to the opossum. These two bones are placed before the os pubis, to which they are attached by their base. They are about two inches long, and gradually diminish in thickness from the base to the extremity, and serve as a fulcrum to the muscles which open the pouch. The antagonists of these muscles shut the pouch so close, that, in the living

animal, it cannot be seen, unless when forcibly dilated by the fingers. In the inside of the pouch there is a number of glands, which secrete a yellowish substance of so disagreeable a smell, that it infects the whole body of the animal. This matter, however, when dried, not only loses its disagreeable odour, but acquires a perfume which may be compared to that of musk. The pouch is not, as has been falsely asserted by Marcgrave and Piso, the place where the young are conceived. The female opossum has an internal uterus, which differs, indeed, from that of other animals, but where the young are conceived and retained till the moment of their birth. Tyson * tells us, that in this animal, there are two uteri, two vaginae, four cornua uteri, four Fallopian tubes, and four ovaria. From the dissections of M. Daubenton, though he agrees not with Tyson in every article, it is certain, that, in the generative parts of the opossum, there are several parts double, which are single in other animals. The glans penis of the male, and the glans clitoridis of the female, are forked, and have the appearance of being double. The vagina, which is single at its entrance, afterwards divides into two canals, &c. This structure is extremely singular, and differs from that of all other quadrupeds.

The opossum is an original native of the

* We shall, therefore, here take a survey and an account of these parts; and we find that there are *two* ovaria, *two* tubæ Fallopianæ, *two* cornua uteri, *two* uteri, and *two* vaginae uteri. — *Tyson, Anatomy of an Opossum*, p. 36.

warm countries of the New World. He appears not, however, to be so strictly attached to warm climates as the *ármadillo*; for he is found not only in Brasil, Guiana, and Mexico, but likewise in Florida, Virginia *, and other temperate regions of America. He is a very common animal; because the female produces often, and, according to most authors, four or five †, some say, six or seven at a time. Marcgrave assures us, that he has seen six living young in the pouch of the female ‡. These young ones were about two inches long, very agile, and came out and went into the pouch several times a day. When new born, they are very small. According to some travellers, when they escape from the uterus, go into the pouch, and attach themselves to the teats, they exceed not the size of flies §. This fact is not so much exag-

* The opossum is common in Virginia and New Spain. — *Hist. Nat. des Antilles*, p. 122.

† Quaternos quinosve parit catulos, quos utero conceptos, editosque in lucem, alvi cavitare quadam, dum adhuc parvuli sunt, condit et servat, &c. — *Hernand. Hist. Mex.* p. 330.

‡ Hæc ipsa quam describo bestia sex catulos vivos et omnibus membris absolutos, sed sine pilis, in hac bursa habebat, qui etiam hinc inde in ea movebantur; quilibet catulos duos digitos erat longus, &c. — *Marcgr. Hist. Bras.* p. 222. They have a pouch under the belly, where they carry their young, six or seven of which are brought forth at a litter. — *Descript. de Nouv. Monde, par de Laet*, p. 485.

§ The female opossum has a double belly, or rather a pendulous membrane that covers the whole belly, without being fixed to it, the inside of which may be seen after the animal has once brought forth. At the hinder part of this membrane, there is an aperture, into which the hand may be in-

gerated as might naturally be imagined; for we have seen, in an animal whose species has a great affinity to that of the opossum, young attached to the teats which were not bigger than large beans; and it is probable, that, in this animal, the uterus is only a place destined for the conception and first formation of the fœtus, the exclusion of which being earlier than in other quadrupeds, its growth is finished in the pouch, where it enters the moment after its premature birth. No person has ascertained the time of gestation in the female opossum, which is probably much shorter than in any other quadruped: and, as this premature exclusion of the fœtus is a singularity of Nature, we must earnestly recommend it to those who have an opportunity of observing the opossum in its native country, to endeavour to discover the time the females go with young, and, after birth, how long the young ones remain attached to the nipples. This last observation is both curious in itself, and may be productive of utility: from it we may perhaps learn some method of preserving the lives of infants who come into the world before the natural period.

That the young opossums, therefore, continue

roduced. It is here where the young retire either to avoid danger, or for the purposes of sucking and sleeping. In this manner they live till they are able to procure food for themselves. . . . I have seen young ones attached to the teats, when they exceeded not the size of a fly. They never quit the teats till they are as large as mice. — *Hist. de la Virginie*, p. 220.

attached, and pasted, as it were, to the teats of the mother, till they acquire strength and growth sufficient to enable them to move about with ease, is a fact no longer to be doubted. Neither is it peculiar to this species, as will appear from the history of the *marmose*, or murine opossum, which is given in the next article. The female of this last species has no pouch under its belly, like the female of the former. It is not, therefore, to the conveniency of a secure retreat afforded by the pouch, that the effects of adhering long to the teats, and acquiring growth in this immoveable situation, are to be ascribed. I make this remark to prevent the pouch from being regarded as a second uterus, or at least as a shelter indispensably necessary to young which are prematurely brought forth. Some authors mention, that the young remain fixed to the teats for several weeks*. Others say, that they continue in the pouch during the first month of their age only†. It is an easy operation to open the pouch of the mother, and to examine and count the young without incommoding them. They never quit the teats, which they

* The young are attached to the teats, and remain several weeks in this situation, till they acquire strength, the use of their sight, and a proper covering of hair. They then fall into the membrane, from which they go out and return at pleasure.—*Hist. de la Virginie*, p. 220.

† Septem plus minusve ut plurimum uno partu excludit fetus, quos donec menstruam ætatem attingant, pro lubitu nunc alvo recondit, nunc iterum prodit. — *Ralph. Hamor. apud Nieremberg*, p. 157.

hold with their mouths till they have strength enough to walk. They then fall into the pouch; and afterwards go out * "in quest of food †. They often return to the pouch to sleep, to suck, and to conceal themselves when danger is apprehended; then the mother flies, carrying her whole offspring along with her. Her belly seems not to be enlarged till long after she has brought forth, and till the young have acquired some bulk; for, during the time of gestation, her size is not perceptibly augmented.

From inspecting the form of the feet, it is easy to perceive, that these animals must walk ill and run slowly. A man, accordingly, it is said, may easily seize them without accelerating

* After bringing forth, the mother puts her offspring into the pouch. They instantly fix upon the teats, and continue to feed upon the milk in this secure and warm retreat. As soon as they are able to move about upon the grass, the mother opens her pouch, and allows them to escape, &c. — *Mem. de la Louisiane, par Dumont*, p. 84.

† The mother brings forth her young blind and naked, and with her fore paws puts them into the pouch, which is a kind of uterus, where they find an agreeable warmth, &c. . . . She takes them not out of this pouch till they have the use of their eyes. She then carries them to some rising ground, where no danger is to be apprehended; and, having opened her pouch, she makes them come out, exposes them to the rays of the sun, and amuses them by sporting and playing. Upon the smallest noise, or suspicion of danger, she soon recalls them by a cry, *tic, tic, tic*, and they run into the pouch for shelter, &c. — *Scha*, vol. i. p. 56. When the mother hears any suspicious noise, she gives a signal by a certain cry, which the young understand, run instantly to their protector, and return into the pouch. — *Mem. de la Louisiane*, p. 83.

his pace*. As a compensation, however, they climb trees with great facility†, and conceal themselves among the leaves, in order to seize birds‡; or rather, they suspend themselves on a branch by the tail, which is so muscular and flexible§, that it is capable of wrapping round any thing it seizes more than once. In this situation, with his body suspended, and his head hanging downwards, he will remain very long,

* This animal is so slow, that he is very easily taken. — *Mem de la Louisiane, par Dumont*, p. 83. I never saw any animal move so slowly; for I have often taken one at my ordinary pace. — *Du Pratz, Hist. de Louisiane*, tom. ii. p. 93.

† Scandit arbores incredibili pernicitate. — *Hist. Mex.* p. 330. — He mounts trees with surprising alacrity; and, like the fox, makes great havoc among domestic fowls. He does no other mischief. — *De Laet*, p. 143. Hoc animal fructibus arborum vescitur. Ideoque non solum ob id arbores scandit, sed etiam cum catulis in crumena inclusis, magna agilitate de arbore in arborem transilit. — *Petrus Martyr, Ocean. decad.* 1. lib. ix. p. 21.

‡ Fœtet animal instar vulpis aut martis: mordax est; vescitur libenter gallinis, quas rapit ut vulpes, et arbores scandendo avibus insidiatur: vescitur quoque sacchari cannis, quibus sustentavi per quatuor septimanas in cubiculo meo; tandem funi cui alligatum erat se implicans, ex compressione obiit. — *Marcgr. Hist. Bras.* p. 223.

§ Cauda . . . qua mordicus firmiterque quicquid apprehendit retinet. — *Hernand. Hist. Mex.* p. 330. His tail is adapted for laying hold of objects: it will, even when seized, wrap round a man's finger. . . . The female, when taken, allows herself, without showing the smallest sign of life, to be suspended by the tail above a fire. The tail adheres of itself; and both the mother and her young thus perish; for no torture is sufficient to make her open her pouch. — *Hist. de la Louisiane, par M. le Page du Pratz*, tom. ii. p. 94.

waiting for the approach of small birds*. At other times, he leaps from one tree to another, nearly in the same manner as the monkeys with prehensile tails, which he also resembles in the structure of his feet. Though carnivorous, and even greedy of blood, he eats reptiles, insects, sugar canes, potatoes, roots, and the leaves and bark of trees†. He might easily be reared as a domestic animal‡; for he is neither mis-

* He is very fond of birds and poultry; and, accordingly, he enters boldly into the court-yards and hen-houses. He even goes into the fields to eat the mahi which is sown there. The instinct with which he hunts his prey is extremely singular. After killing a small bird, he does not eat it immediately, but lays it down, in an exposed situation, near a tree. He then mounts the tree, suspends himself by the tail on a branch which is nearest to the bird, and waits patiently till some carnivorous bird comes to carry it off, upon which he instantly darts, and makes a prey of both.—*Mém. de la Louisiane, par Dumont*, p. 81.—He hunts during the night; and wages war against the poultry, whose blood he sucks, but does not eat the flesh.—*Hist. de la Louisiane, par M. le Page du Pratz*, p. 93.

† Vescitur cohortalibus quas vulpecularum mustelarumve sylvestrum more jugulat, illarum sanguinem absorbens, cætera innoxium ac simplicissimum animal. . . . Pascitur etiam fructibus, pane, oleis, frumentaceis, aliisque, veluti nos experimento cognovimus, alentes istud domi, ac in deliciis habentes.—*Harmond. Hist. Mex.* p. 339. He climbs trees with great alacrity, and feeds upon birds. Like the fox, he preys upon poultry; but, when prey of this kind fails him, he eats fruits.—*Hist. des Antilles*, p. 121.

‡ Victitat carnibus et fructibus, herbis et pane; idioque a multis animi gratia domi nutritur.—*Marcgr. Hist. Brasil.* p. 222.

chievous nor ferocious, and is easily tamed. But he disgusts by his smell, which is ranker than that of a fox *. His figure is also disagreeable; for his ears resemble those of the ounce, his tail is like a serpent, his mouth stretches near to his eyes, and his body has always a dirty appearance; because his hair, which is neither smooth nor curled, seems as if it were covered with dung †. The offensive odour proceeds from his skin; for his flesh is not bad ‡. He is one

* The opossum resembles the Spanish fox; but he is smaller, and has a more insupportable smell. — *Descript des Indes Occidentales, par de Laet*, p. 85.

† They have a hideous aspect, and seem always to be covered with dung. — *Mem. de la Louisiane, par Dumont*, p. 83. Their hair is gray, and, though fine, it is never smooth. The female natives spin it, and make garters of it, which they afterwards dye red. — *Hist. de la Louisiane, par M. le Page du Pratz*, tom. ii. p. 94.

‡ Testatur ipse Rraphe comedisse hoc animal, et esse grati et salubris nutrimenti. — *Nieremberg, Hist. Nat. Peregrin.* p. 157. Carnibus hujus animalis non solum Indi libentissime vescuntur, verum etiam hanc cæterorum animalium quascunque carnes gustu, suavitate nobilitatas, antecellere prædicant. Quapropter legitur in historia Indica, quod habitatores insulæ Cubæ, observantes magnam horum animalium quantitatem vagantium super arbores secus littora insulæ crescentes, clanculum accedentes, et de improvviso, magno impetu arborem excutientes, has belluas cadere in aquam cogunt; tunc innatantes illas apprehendunt, postea in cibos multifarie coquunt. *Aldrov. de Quadr. Digit.* lib. ii. p. 225. The flesh of the wild rat is very good, having nearly the same taste as that of a pig. — *Mem. de la Louisiane, par Dumont*, p. 83. The flesh of this animal is excellent, and in taste resembles that of a pig. — *Hist. de la Louisiane, par M. le Page du Pratz*, p. 94. The opossum is a stinking animal; but his flesh is very good. — *Voyage de Corcal*, tom. i. p. 176.

of those animals to which the savages give a preference in their hunting, and whose flesh they eat with pleasure.

M. de la Borde, king's physician at Cayenne, informs me, that he fed three opossums in a small cask, where they suffered themselves to be managed with ease. They eat fish, flesh raw or roasted, bread, biscuit, &c. They licked each other perpetually, and made the same purring noise as cats do when caressed.

"I did not perceive," says he, "that they had any bad smell. Some species are large, and others small*. They all carry their young in a pouch under their bellies; and the young never quit the teats, even when sleeping. The dogs kill, but do not eat these animals. They make a kind of grunting noise, which extends to no great distance. They are easily tamed. They go into the hen-houses and devour the fowls. Their flesh is not good to eat: in certain species, its odour is so insupportable, that the animal receives the epithet of *stinking* from the inhabitants of Cayenne."

These stinking opossums must not be confounded with the true *mouffettes*, or stinking weesels, which constitute a very different genus of animals.

M. de Vosmaër, director of the prince of Orange's Cabinet of Natural History, has added

* There was lately sent to the Royal Cabinet, from Cayenne, a skin of one of these small opossums, which, though the animal was an adult, exceeded not three inches and a half in length, and the tail was four inches and a half long.

a note to page 6 of his Description of a Flying Squirrel, published at Amsterdam in the year 1767, in which he says,

“ The *coescoes* is the *bosch* or *beusrult* of the East Indies, the *philander* of Seba, and the *didelphis* of Linnæus. The learned M. de Buffon denies absolutely its existence in the East Indies, and limits it entirely to the New World. We can, however, assure this learned naturalist, that Valentin and Seba were right in making these animals common to Asia and America. Last summer, I myself received a male and female from the East Indies. The same species has likewise been transmitted from Amboina to Doctor Schlosser of Amsterdam. The chief difference between the *coescoes* of the East and that of the West Indies, consists, according to my observation, in the colour of the hair, which, in the East India male, is all of a yellowish white: that of the female is a little browner, with a black, or rather brown line on the back. The head of the West India kind is shorter; but the head of the male appears to be longer than that of the female. The ears of the East are much shorter than those of the West India species. The description of the second species, mentioned by Valentin, is too diffuse to afford any certain information.”

That M. Vosmaër received male and female animals from the East Indies, under the denomination of *coescoes*, I have no reason to doubt. But the differences which he himself points out between the *coescoes* and the opossums, may

lead us to conclude that they are not animals of the same species. I acknowledge, however, that M. de Vosmaër's criticism is just, when he remarks, that I made Seba's three philanders the same animal, whilst, in fact the third, represented in his 39th plate, is a different species, and is found in the Philippine islands, and, perhaps, in some other parts of the East Indies, where it is known by the name of *coescos cuscus* or *cusos*. In the voyage of Christopher Barchewitz, I find the following notice :

“ In the island of Lethy, there are *cuscus* or *cuscos*, whose flesh has nearly the taste of that of a rabbit. In colour they resemble the marmot. The eyes are small, round, and brilliant. The legs are short; and the tail, which is long, has no hair on it. This animal leaps from one tree to another, like the squirrel, and then fixes its tail round a branch, that it may eat the fruit more commodiously. It diffuses a disagreeable odour, like that of the fox. The female has a pouch under the belly, into which her young go out and in below her tail. She leaps from one tree to another, conveying her young in this pouch *.”

From the pouch under the belly, and the prehensile tail, it appears, that the cuscus or cusos of the East Indies is really an animal of the same genus with the American opossum. But this is by no means a proof that it belongs to the same species with any of those which inhabit Ame-

* Voyage de Barchewitz, p. 532.

rica. This would be the only example of such a coincidence. If M. Vosmaër had engraven the figures of these coëscoes, as he mentions in the text, we would have been enabled to form a more complete notion of the similarities and differences which subsist between the Asiatic coëscoes and the American opossums. But I am still persuaded that those of the one continent will never be found in the other, unless they are transported thither. I refer the reader to what I have said on this subject in page 89 of this volume.

We mean not to deny the possibility of equal climates, in both continents, producing some animals of the precise same species. We formerly remarked, that the same temperature, in different parts of the globe, would produce the same beings, both in the animal and vegetable kingdoms, if all other circumstances were equal. We treat not here, however, of philosophical possibilities, which may be more or less probable, but of a very general fact, of which numberless examples may be given. It is certain, that, when America was discovered, none of the following animals existed in the New World: the elephant, the rhinoceros, the hippopotamus, the camelopard, the camel, the dromedary, the buffalo, the horse, the ass, the lion, the tiger, the apes, the baboons, and a number of others, which I have enumerated in p. 233 of the preceding volume. In the same manner, the tapir, the lama, the pecari, the jaguar, the cougar, the agouti, the paca, the coati, the

sloth, and several others formerly mentioned, did not exist in the Old Continent. Is not this multitude of examples sufficient to guard us against pronouncing, like M. Vosmaër, that such and such animals belong equally to the southern regions of both worlds?

The following passage should be referred to the Indian *cuscus* or *cusos* :

“ In the Molucca islands,” Mandelslo remarks, “ there is an animal called *cusos*, which dwells on trees, and feeds on their fruits. It resembles a rabbit, and has thick, frizzled, coarse hair, of a mixed colour between gray and red. The eyes are round and vivacious, the feet small, and the tail so strong, that the animal hangs by it on the branches, in order the more easily to reach the fruit *.”

In this passage no mention is made of the pouch under the belly, which is the most distinguishing character of the opossums. But I still maintain, that, if the *cusos* of the East Indies has this character, it is certainly a species which approaches very near to the American opossums; and I shall be inclined to think that it differs from the opossum nearly in the same manner as the jaguar differs from the leopard. Of all the animals belonging to the southern climates of both continents, the two last, without being of the same species, make the nearest approach to each other.

* Voyage de Mandelslo, suite d'Olearius, tom. ii. p. 384.



FEMALE MURINE OPOSSUM.



MURINE OPOSSUM.

THE MURINE OPOSSUM*.

- * THIS species seems to make a very near approach to the former. They both belong to the same climate, and to the same continent.

* CHARACTER SPECIFICUS.

DIDELPHIS MURINA. D. cauda semipilosa, mammis senis. — *Linn. Syst. Nat. Gmel.* i. p. 107. — *Schreb.* iii. p. 545, pl. 149.

Didelphis (Murina) rostro acutiusculo, ungue pollicum palmarum acuto, cauda semipilosa. — *Erxleb. Mamm.* p. 80.

Philander (Americanus) saturate spadiceus in dorso, in ventre dilute flavus. — *Briss. Quadr.* p. 211.

Philander mammis extra abdomen, cauda longissima tereti nuda, corpore longiore. — *Gron. Zooph.* i. p. 9, No. 33.

Mus Silvestris Americanus mas, Scalopes dictus †. — *Seb. Mus.* i. p. 43, pl. 31, fig. 1; et p. 49, t. 31, fig. 2, femina.

† *Note by Buffon.* — “The name *scalopes*, given by Seba to this animal, and which Klein and Brisson have adopted, is very ill applied. The *scalopes* of the Greeks is certainly not the marmoset of Brasil. Besides, it is impossible to determine, from the writings of the ancients, what animal they meant by the name *scalopes*: ad finem, quidam mures sunt, quos *scalopes* vocant, ut Scholiastes Aristophanis in *Acharnensibus* animadvertit. — *Aldrov. de Quadr. Digit. Vivip.* p. 416. This, I believe, is the only notice we have concerning the *scalopes*; and it is not sufficient to point out a particular species, and far less can it justify the application of the name to an animal of the New World.”

They likewise resemble each other in the form of the body, in the structure of the feet, in the *prehensile* tail, which is covered with scales through its whole extent, except at the origin, where it is covered with hair, and in the arrangement of the teeth, which are more numerous than in other quadrupeds*. But the murine opossum is much smaller, and its muzzle is sharper: the female has no pouch under the belly; there are only two longitudinal folds near the thighs, between which the young attach themselves to the teats. The parts of generation both of the male and female resemble, in their form and position, those of the Virginian opos-

LA MARMOSE. — *Buff. Hist. Nat. par Sonn.* xxviii. p. 65, pl. 3, fig. 1, 2.

MURINE OPOSSUM. — *Penn. Quadr.* ii. p. 23. — *Shaw's Gen. Zool.* i. p. 484.

HABITAT

in calidioribus Americæ australis.

W.

This opossum has long broad ears, rounded at the end, and thin and naked. The eyes are encompassed with black. The face, head, and upper part of the body, are of a tawny colour, and the belly of a yellowish white. The feet are covered with short whitish hair. The toes are formed like those of the preceding species. The tail is slender, and covered with minute scales to the very rump. The length, from nose to tail, is about six inches and a half, and that of the tail the same. The female wants the pouch or false belly; but, on the lower part, the skin forms on each side a fold, between which the teats are lodged. This species varies in colour. I have seen one from Guiana, which was brown above, and whitish beneath. — *Penn. Synops. Quadr.* p. 207.

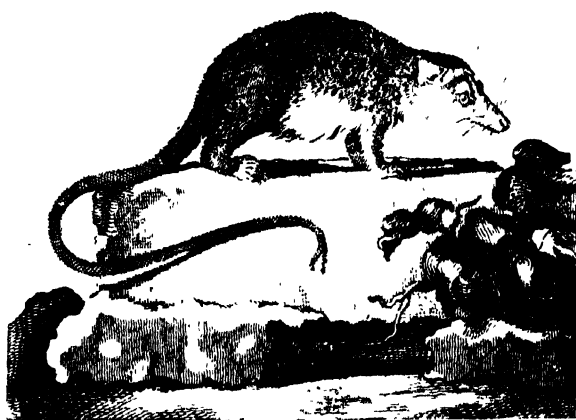
* Both the Virginian opossum and the marmose have fifty teeth.

sum. The glans of the male is also forked and placed in the anus; and this last aperture seems likewise, in the female, to be the orifice of the vagina. The birth of the young, in this species, seems to be still more premature. When they are brought forth, and attach themselves to the teats, they are hardly so large as small beans. The litter is also more numerous: I have seen ten young, each of them fixed to a separate teat, and yet the mother had four teats unoccupied; so that, in all, she had no less than fourteen teats. It is upon females of this species that the observations recommended in the preceding article ought chiefly to be made; for I am persuaded, that they bring forth a few days after conception, and that the young, at the time of exclusion, are only fœtuses, as they exceed not one fourth part of the growth which fœtuses generally acquire at that period. The delivery of the mother is always a very early abortion, and the fœtuses preserve their lives solely by fixing to the teats, and never quitting their hold, till they attain that degree of strength and growth which they would have naturally acquired in the uterus, if they had not been thus prematurely excluded.

The murine opossum has the same dispositions and manners as the Virginian species. They both dig holes, burrow in the ground, fix themselves to the branches of trees by the extremities of the tail, and dart upon birds and small animals. They likewise eat fruits, grain, and roots. But they prefer fish and crabs, which, it is said,

they catch with their tails. This fact is extremely doubtful, and accords not with the natural stupidity ascribed to these animals, which, according to the testimony of most travellers, can neither move, nor fly, nor defend themselves*.

* Bajon says that the murine opossum is called *quatre-ouëils* in Cayenne, on account of a white spot above each eye. It is very common, and although found in the neighbourhood of villages is not, like the preceding species, destructive to the poultry W.



MEXICAN OPOSSUM.

THE MEXICAN OPOSSUM*.

THIS animal was first taken notice of by

* CHARACTER SPECIFICUS.

DIDELPHIS CAYOPOLLIN. D. cauda corpore longiore, marsupio nullo, orbitalium margine nigro. — *Linn. Syst. Nat. Gmel.* i. p. 106. — *Schreb.* iii. p. 544, t. 148.

Philander (Africanus) saturate spadiceus in dorso, in ventre exalbido flavicans, cauda ex saturate spadiceo maculata. — *Briss. Quadr.* p. 212.

Animal caudimanum sive cayopollin. — *Nieremb. Hist. Nat.* p. 158.

CAYOPOLLIN. — *Fernand. Nov. Hisp.* p. 10.

MUS AFRICANUS†, KAYOPOLLIN DICTUS, mas. — *Seb. Mus.* i. p. 49, t. 31, fig. 3.

MUS INDICUS, dictus CAYOPOLLIN. — *Charlet, Exerc.* p. 25.

LE CAYOPOLLIN. — *Buff. Hist. Nat. par Sonn.* xxviii. p. 73, pl. 3, fig. 3.

MEXICAN OPOSSUM. — *Penn. Hist. Quadr.* ii. p. 24. — *Shaw's Gen. Zool.* i. p. 478.

HABITAT

in montosis novae Hispaniae; pariens in arboribus. W.

This animal has large, angular, transparent ears. Its nose is thicker than that of the former kind. There is a light border of black round the eyes. The hairs on the head and upper part of the body are ash coloured at the roots and tawny at the tips. The belly and legs are whitish. The tail is long, pretty thick, varied with brown and yellow, hairy

† Erronea Seba Africanum animal fecit, et ex hoc postea alii auctores. W.

Fernandes *. The cayopollin, says he, is a small animal, about the size of a rat. It resembles the opossum in the muzzle, the ears, and the tail, which last it uses as a hand. The ears are thin and transparent. The legs and feet are white. The young, when frightened, lay fast hold of the mother, who carries them up to the nearest tree. This species is found in the mountains of New Spain. Nieremberg † has copied these remarks verbatim, without adding any of his own. Seba ‡, who first gave a figure of this animal, has not described it. He only says, that its head is somewhat thicker, and its tail larger, than those of the marmose or murine opossum, and that, though it be of the same genus, it belongs to a different climate, and even to a different continent. He then refers to Nieremberg and Johnston for farther information concerning this animal. But it is evident, that neither Nieremberg nor Johnston had ever seen it; for they only follow Fernandes. None of these three authors say that it is a native of Africa. They mention it, on the contrary, as peculiar to the mountains of the warm regions of America; and yet Seba, without the smallest authority, pretends that it is an African animal. That which we

near an inch from its origin, and the rest is naked. The length, from nose to tail, is about seven inches and a half, and that of the tail more than eleven. — *Penn. Synops. Quadr.* p. 208.

* Franc. Fernandes, *Hist. Quadr. Nov. Hisp.* p. 10

† Eus. Nieremb. *Hist. Nat. Peregr.* p. 158.

‡ Seba, tom. i. p. 49, tab. 31, fig. 3.

saw, unquestionably came from America. It was larger, the muzzle was not so sharp, and the tail was longer than those of the murine opossum, and in every particular it approached nearer than the latter to the Virginian opossum. These three animals have a great resemblance in their external and internal structure, in the supernumerary bones of the pelvis, in the form of the feet, in the premature birth, in their long and constant adherence to the teats, and in their manners and dispositions. They all belong to the same climate of the New World. They are never found in the cold regions of America, and cannot live even in temperate climates. Besides, they have all an ugly aspect. Their mouth, which is split like that of a pike, their ears, which resemble those of a bat, their serpent-like tail, and their feet, shaped like those of a monkey, exhibit a strange picture, which is rendered still more disagreeable by their offensive smell, and by the slowness and stupidity that accompany all their actions and movements.

THE CRAB-EATER*.

The name *crab-eater*, or *crab-dog*, has been given to this animal, because crabs are his principal food. He has very little relation to the dog or fox, to which some travellers have com-

* CHARACTER SPECIFICUS.

DIDELPHIS CANCRIVORA. D. cauda squamosa fere calva, corpus prope æquante, plantarum ungue pollicari plano.—*Linn. Syst. Nat. Gmel.* i. p. 103.

LE CRABIER.—*Buff. Hist. Nat. par Sonn.* xxviii. p. 81, pl. 4.

CAYENNE OPOSSUM.—*Penn. Hist. Quadr.* ii. p. 24.—*Shaw's Gen. Zool.* i. p. 482.

HABITAT

in Cayennæ paludosis.

W.

Cayenne opossum, with a long slender face; ears erect, pointed, and short; the coat woolly, mixed with very coarse hairs, three inches long, of a dirty white from the roots to the middle; from thence to the ends of a deep brown; sides and belly of a pale yellow; legs of a dusky brown; thumb on each foot distinct; on the toes of the fore-feet, and thumb on the hind, are nails; on the toes of the hind-feet crooked claws; tail very long, taper, naked and scaly. Length seventeen inches; that of the tail fifteen and a half. The subject measured was very young.—*Penn. Synops. Quadr.* edit. 2, p. 309.

pared him. He seems to be more nearly allied to the opossums; but, he is much larger, and the female crab-eater carries not her young, like the female opossum, in a pouch under her belly. Hence the crab-eater appears to be a detached species, and different from all those we have formerly described.

In the figure, the long, naked, scaly tail, the large thumbs without claws on the hind-feet, and the flat claws on the fore-feet, are remarkable. This animal, whose skin is preserved in the Royal Cabinet, was young when it was transmitted to us. It is a male; and the following is a description of it:

The length of the whole body, from the nose to the origin of the tail, is about seventeen inches. Before, it is six inches three lines high, and six inches and a half behind. The tail, which is grayish, scaly, and naked, is fifteen inches and a half long, ten lines in circumference at the origin, and gradually tapers to a point.

As the legs of this animal are very short, he has, at a distance, some resemblance to a terrier. The head is not very different from that of a dog, and exceeds not four inches one line in length, from the point of the nose to the occiput. The eye is not large; the edges of the eyebrows are black; and, above the eye, there are hairs of an inch and a quarter in length. There are similar hairs on the side of the cheek near the ear. The whiskers are black,

and about an inch and a half long. The opening of the mouth is near two inches. The upper jaw is armed, on each side, with a crooked canine tooth, which reaches beyond the under jaw. The ear is brown, naked, broad, and round at the extremity.

The hair on the body is woolly, and interspersed with other long stiff black hairs. These long hairs increase upon the thighs and the spine of the back, which is totally covered with them, and form a kind of mane from the middle of the back to the origin of the tail: they are three inches long, of a dirty white colour from the base to the middle, and afterwards of a dark brown as far as the point. The hair on the sides, as well as on the belly, is yellowish white; but it approaches more to yellow toward the shoulders, and on the thighs, neck, breast, and head, where this yellow tincture is mixed in some places with brown. The sides of the neck are yellow; and the legs and feet are of a blackish brown colour. There are five toes on each foot. The fore-foot is an inch and three quarters long, the largest toe nine lines, and the furrowed claw two lines. The toes are a little bended, like those of the rat, the thumb alone being straight. The hind-feet are an inch and eight lines long, the largest toe nine lines, and the thumb half an inch. The thumb is thick, broad, and at a distance from the toes, as in the apes. The nail of the thumb is flat; but those of the other toes are crooked,

and reach beyond their points. The thumb of the fore-foot is straight and not removed from the other toe.

M. de la Borde informs me, that this animal is very common in Cayenne, and that it always frequents the Savannahs, and other marshy places.

“ It climbs trees,” he remarks, “ with great dexterity, and continues oftener upon them than on the ground, especially during the day. It has fine teeth, and defends itself against the dogs. Crabs are its principal nourishment, and it is always fat. When unable to draw the crabs from their holes with its foot, it introduces the tail, which it uses as a hook. The crab sometimes lays hold of the tail, and makes the animal cry. This cry has some resemblance to that of a man, and is heard at a great distance. But its ordinary voice is a kind of grunting like a pig. The female produces four or five young at a litter, and deposits them in the hollows of old trees. The natives of the country eat its flesh, which resembles that of a hare. These animals are easily tamed, and they are fed in the houses like dogs and cats, with all kinds of victuals. Hence their taste for crabs is by no means exclusive.”

It is alleged, that there are two species of crab-eaters in Cayenne. The first is the animal we have already described: the other is not only a different species, but belongs to a different

genus. Its tail is totally covered with hair, and it seizes crabs with its paws only. These two animals resemble each other in the head alone; and they differ in the figure and proportions of the body, as well as in the structure of the feet and claws.



FEMALE PITALANGER.



• PHALANGER.

THE PHALANGER, OR SURINAM OPOSSUM *.

THE male and female phalanger, which were transmitted to us under the appellation of *Surinam rats*, are much less allied to the rats, than

* CHARACTER SPECIFICUS.

DIDELPHIS ORIENTALIS. — *D. cauda ad medium fere pilosa, prehensili, corpore longiore, folliculo abdominali plantarum digitis duobus intermediis coadunatis.* — *Linn. Syst. Nat. Gmel.* i. p. 108. — *Pall. Miscell. Zool.* p. 59. — *Schreb. iii.* p. 550, pl. 152.

Philander (capite crasso) ex rufo luteus in dorso, in ventre ex albo flavicans. — *Briss. Regn. An.* p. 293, No. 8.

Mus seu sorex Americanus major, agrestis, capite grandi pullus. — *Seb. Mus.* i. p. 50, pl. 31, fig. 8.

DE COESCOES. — *Valent. Amboin.* iii. p. 272, fig. in pedibus vitiosa.

LE PHALANGER. — *Buff. Hist. Nat. par Sonn.* xxxi. p. 302, pl. 27, 28.

PHALANGER. — *Penn. Hist. Quadr.* ii. p. xxvii. — *Shaw's Gen. Zool.* i. p. 491.

HABITAT

in insulis Moluccis, forsan quoque in nova Hollandia.

IV.

Opossum with a thick nose, short ears covered with hair, eight cutting teeth in the upper jaw, and two in the lower. The hair on the upper part of the body is reddish, mixed with light ash colour and yellow. The hind part of the

the animals whose history we have given under the name of *marmose*, or murine opossum, and *cayopollin*, or Mexican opossum. We have rejected the denomination of *Surinam rats*, because it is both compounded and ill applied. As the animal is mentioned by no traveller or naturalist, we have called it the *phalanger*, because its phalanges are very singularly constructed, and because the two first toes of the fore-feet are attached to each other, as far as the end of the last phalanx. The thumb is separated from the other toes, and has no claw. This last character is not peculiar; for the Virginian and murine opossums have the same kind of thumb, but none of them have united phalanges.

These animals seem to vary among themselves, as appears from the figures of the male and female. They are of the size of a small rabbit, or of a very large rat, and are remarkable for the excessive length of their tail, the prolongation of their muzzle, and the form of their teeth, which alone would be sufficient to distinguish them from the murine and Virginian opossums, the rats, and every other species of quadrupeds.

head, and middle of the back, are marked with a black line. The throat, belly, legs, and part of the tail, are of a dirty yellowish white. The rest of the tail is brown and yellow. The body of the female is marked with white. The first and second toes of the hind-feet are closely united. The claws are large. The thumb on the hind-feet is distinct. The bottom of the tail is covered with hair for near two inches and a half; the rest of it is naked. The length of the animal, from nose to tail, is near nine inches, and that of the tail ten. — *Penn. Synops. Quadr.* p. 209.

We were misinformed when we said that the animals to which we have given the name of Phalanger, belonged to the New Continent. A merchant sold them to me under the name of Surinam rats, but he had probably been deceived. M. Pallas is the first who has noticed the mistake, and we are now assured that the phalanger is found in the East Indies, and also in the southern parts of the world, as in New Holland: we are also certain that it has never been seen in the American continent. Mr. Banks justly observes that I am deceived, and that he has found an ~~animal~~ in New Holland which so strongly resembles the phalanger, that it ought to be considered as very nearly allied to that species.

THE MERIAN OPOSSUM*.

THIS animal is a native of the same climate, and belongs to a neighbouring species with the other opossums. Sibilla Merian is the first writer

* CHARACTER SPECIFICUS.

DIDELPHIS DORSIGERA. D. cauda basi pilosa corpore longiore, digitis manuum muticis. — *Linn. Syst. Nat. Gmel.* i. p. 107. — *Erxleb. Mamm.* p. 83. — *Schreb.* iii. p. 546, pl. 150.

Philander (Surinamensis) ex rufo helvus in dorso, in ventre ex flavo albicans. — *Briss. Quadr.* p. 212.

Genus gliris sylvestris. — *Merian. Jonst. Sur.* p. 66, t. 66.

Mus seu sorex silvestris Americanus mas. — *Seb. Mus.* i, p. 49, pl. 31, fig. 4, bon.

Muris silvestris Americani, femina, *Ibid.* fig. 5, bon.*

Glis silvestris Americanus cum catulis suis. — *Ibid.* ii. p. 90, pl. 84, fig. 4, bon.

LE PHILANDRE DE SURINAM. — *Buff. Hist. Nat. par Sonn.* xxviii. p. 78.

MERIAN OPOSSUM. — *Penn. Hist. Quadr.* ii. p. 27. — *Shaw's Gen. Zool.* i. p. 485.

HABITAT

in Surinamo intra terram.

W.

Merian opossum, with long, sharp pointed, naked ears; head, and upper part of the body, of a yellowish brown colour; the belly white tinged with yellow; the fore-feet divided into five fingers; the hinder into four and a thumb, each furnished with flat nails; tail very long, slender, and,

who has given a figure and a short account of it*. Seba afterwards gave Merian's figure for the female, and added a new figure for the male, with a kind of description. This animal, says he, has very brilliant eyes, which are surrounded with a circle of deep brown hair. The body is covered with soft hair, or rather wool, of a reddish yellow colour, but of a bright red on the back. The front, muzzle, belly, and feet, are whitish yellow. The ears are naked, and pretty hard. On the upper lip, and also above the eyes, there are long hairs in the form of whiskers. Its teeth, like those of the dormouse, are very sharp. Upon the tail of the male, which is naked, and of a pale red colour, there are dusky red spots, which appear not on the tail of the female. The feet resemble the hands of an ape; those before have four toes, and the thumb garnished with short, blunt nails; but on the hind-feet the thumb alone has a flat, blunt nail, the other four toes being armed with small sharp claws. The young of these animals grunt nearly in the same manner as a pig. The paps of the female resemble those of the murine opos-

except at the base, quite naked.—*Penn. Synops. Quadr.* p. 210.

* Hic genus gliris sylvestris depictum est, qui catulos quorum vulgo quinque vel sex una foetura enititur in dorso secum portat; ex flavo fusci coloris, at subucula ejus alba est: cum antra exeunt alimenti causa, a catulis circum curruntur, qui jam saturi vel molestias suspicantes, illico matris dorsum ascendunt, et caudas suas parentum caudis involvunt, qui illos statim in antra apportant.—*Mar. Sibil. Merian. Insect. Surinam*, p. 66, fig. tab. 66.

sum. Seba properly remarks, that, in the figure given by Merian, the feet and toes are ill represented *. The females produce five or six at a litter. The tail is very long, and prehensile, like that of the sapajous. The young mount upon the back of the mother, and adhere firmly with their tails twisted round hers. In this situation she carries them about with great nimbleness and security.

* Seba, vol. i. p. 49, tab. 21, fig. 4.



ELEPHANT

THE ELEPHANT*.

IF the human species be excepted, the elephant is the most respectable animal in the world. In size he surpasses all other terrestrial

* ELEPHAS.

CHARACTER GENERICUS.

Dentés primores nulli utrinque.

Laniarii superiores elongati; inferiores nulli.

Proboscis, longissima prehensilis.

Corpus nudiusculum.

CHARACTER SPECIFICUS.

ELEPHAS MAXIMUS. — *Linna. Syst. Nat. Gmel.* i. p. 3
Erzleb. Mamm. p. 203.

ELEPHAS. — *Plin.* lib. viii. cap. 1. — *Ray's Synops. Quadr.*
p. 131. — *Klein Quadr.* p. 36. — *Ludolph. Æthiop.* p. 54. —
Boullaye-le-Gouz, p. 240. — *Dellon's Voyage,* p. 71. — *Leo*
Afric. p. 336. — *Kolben's Cape,* vol. ii. p. 98. — *Bosman's*
Hist. of Guinea, p. 230. — *Linschottan. Iter,* p. 55. — *Du*
Halde's China, vol. ii. p. 224. — *Amanton's Voyage,* p. 138.
— *Macle's Travels,* p. 107. — *Account of Cochin China,*
p. 795. — *Burton's Guinea,* p. 141, 200. — *Sav. tom. i.* p. 175,
tab. 3. — *Edwards,* p. 221.

L'ELEPHANT. — *Buff. Hist. Nat. par Sonn.* xxviii. p. 89,
pl. 5, 6, 7.

GREAT ELEPHANT. — *Penn. Hist. Quadr.* i. p. 165, pl. 34,

creatures; and, by his intelligence, he makes as near an approach to man, as matter can approach spirit *. Of all animated beings, the elephant,

35.—*Shaw's Gen. Zool.* i. p. 212, pl. 63, 64.—*Wood's Zoography*, i. p. 103, pl. 6.

HABITAT

in India ejusque insulis majoribus et Africa: abundat in Africa australiore. Amat paludosas silvas, degitque ad amnes gregarius.

W.

* The elephant has a long cartilaginous trunk, formed of multitudes of rings, pliant in all directions, and terminated with a small moveable hook. The nostrils are at the end of the trunk, which is used like a hand, to convey any thing into the mouth. This animal has no cutting teeth, but four large flat grinders in each jaw, and in the upper, two vast tusks, pointing forwards, and bending a little upwards; the largest of them imported into Britain are seven feet long, and weigh 152 pounds each. The eyes are small, and the ears long, broad, and pendulous. The back is much arched. The legs are thick, and very clumsy and shapeless. The feet are undivided; but their margins are terminated by five round hoofs. The tail is like that of a hog. The colour of the skin is dusky, with a few scattered hairs on it.—*Penn. Synops. Quadr.*

In Greek, *Ελεphas*; in Latin, *Elephantus*, *Barrus*; in Spanish, *Elephante*; in German, *Helphant*; in the East, *Elfil*. *Phil*, or *Fil*, is a Chaldean word which signifies *ivory*, and Munster uses it to denote the *Elephant*. In the East Indies the elephant was formerly called *Barre*; and it is probable that *Barrus* was derived from this word, and afterwards applied by the Latins to the elephant.—*Gesm. cap. de Elephantis*. At Congo, it is called *Manzao* or *Manzo*.—*Drake*, p. 104.

* Valet sensu et reliqua sagacitate ingenii excellit elephas; *Arist. Hist. Anim.* lib. ix. cap. 46.—Elephanti sunt natura mites et mansueti, ut ad rationale animal proxime accedant.—*Strabo*. Vidi elephantos quosdam qui prudentiores mihi

the dog, the beaver, and the ape, have the most admirable instinct. But this instinct, which is only a result of all the animal powers, both internal and external, manifests itself by very different effects in each of these species. Naturally, and when left at full liberty, the dog is as cruel and bloody as the wolf; but amidst all this ferocity of disposition, there is one flexible point which we have cherished. Hence the natural dispositions of the dog differ not from those of other rapacious animals, but by this point of sensibility, which renders him susceptible of affection and attachment. It is from Nature that he derives this germ of sentiment, which man has cultivated and expanded by living long and constantly in society with this animal. The dog alone was worthy of this distinguished regard; for, being more susceptible of foreign impressions than any other quadruped, all his relative powers have been brought to perfection by his commerce with man. His sensibility, his docility, his courage, his talents, and even his manners, are modified and formed by the example and qualities of his master. We ought not, therefore, to ascribe to him all the powers he appears to possess. His most brilliant qualities are borrowed from us. He has acquired more than other animals, because he is more capable of making acquisitions. Instead of having a repugnance to man, he has a natural bias in favour of the human race.

videbantur quam quibusdam in locis homines.—Vartomannus, apud Gesn. cap. de Elephanto.

This gentle sentiment, which is always alive, is made evident by the desire of pleasing, and has produced docility, fidelity, perpetual submission, and, at the same time, that degree of attention which is necessary for acting accordingly, and for giving ready obedience to all the commands he receives.

The ape, on the contrary, is as untractable as he is extravagant. His nature, in every point, is equally stubborn. He has no relative sensibilities, no gratitude, no recollection of good treatment, or of benefits received. Averse to the society of man, and to every kind of restraint, he has a violent propensity to do every thing that is hurtful or displeasing. But these real faults are compensated by apparent perfections. In his external figure, he resembles man: he has arms, hands, and fingers, the use of these parts alone renders him superior in address to other animals; and the relations they give him to us, in similarity of movements and conformity of actions, please and deceive us, and lead us to ascribe to internal qualities, what depends solely on the structure of his members.

The beaver, whose individual qualities seem far inferior to those of the dog and ape, has, notwithstanding, received from Nature a gift almost equivalent to that of speech. He makes himself so well understood to his own species, that they unite in society, act in concert, undertake and execute large and long continued works; and this social attachment, as well as the result of their mutual intelligence, are more entitled to

our admiration than the address of the ape, or the fidelity of the dog.

Hence the genius of the dog (if I may be permitted to profane this term) is borrowed; the ape has only the appearance of it; and the talents of the beaver extend no farther than to what regards himself and his associates. But the elephant is superior to all the three; for in him all their most exalted qualities are united. In the ape, the hand is the principal organ of address. The trunk of the elephant affords him the same means of address as the ape. It serves instead of an arm and a hand; and by it he is enabled to raise and lay hold of small as well as of large objects, to carry them to his mouth, to place them on his back, to embrace them fast, or to throw them at a distance. He has, at the same time, the docility of the dog, and, like that animal, he is susceptible of gratitude, capable of attachment, is easily accustomed to man, submits less by force than good treatment, serves him with zeal, fidelity, knowledge, &c. In fine, the elephant, like the beaver, loves the society of his equals, and can make himself to be understood by them. They are often observed to assemble together, to disperse, and act in concert; and if they receive no mutual edification, if they carry on no common operation, it must, perhaps, be ascribed to the want of room and of tranquillity; for men have been very anciently multiplied in all the countries inhabited by the elephant; he is, therefore, perpetually disturbed, and is no where a peaceable possessor of suf-

ficient space to establish a secure abode. We have seen, that all these advantages are necessary to unfold the talents of the beaver, and that in every place frequented by men, he loses his industry, and receives no edification from associating. Every being has its relative value in Nature. To form a just estimation of the elephant, he must be allowed to possess the sagacity of the beaver, the address of the ape, the sentiment of the dog, together with the peculiar advantages of strength, largeness, and long duration of life. Neither should we overlook his arms, or tusks, which enable him to transfix and conquer the lion. We should also consider that the earth shakes under his feet; that with his hand he tears up trees *; that by a push of his body, he

* *Veteres proboscidem elephantum manum appellaverunt. — Eadem aliquoties nummum e terra tollentem vidi, et aliquando detrahentem arboris ramum, quem viri viginti-quatuor fune trahentes ad humum flectere non potueramus; cum solus elephas tribus vicibus motum detrahebat. — Vartomannus, apud Gesner. cap. de Elephanto. Silvestres elephantum fagos, oleastros, et palmas dentibus subvertunt radicitus. — Oppian. Promuscis elephantum naris est quæ cibum, tam siccum quam humidum, ille capiat, orique perinde ac manu admoveat. Arbores etiam eadem complectendo evellit; denique ea non alio utitur modo nisi ut manu. — Aristot. de Partib. Animal. lib. ii. cap. 16. Habet præterea talem tantamque narem elephantus, ut ea manus vice utatur. . . . Suo etiam rectori erigit atque offert, arbores quoque eadem prosternit, et quoties immersus per aquam ingreditur, ea ipsa edita in sublimi reflat atque respirat. Arist. Hist. Anim. lib. ii. cap. 1. The strength of the elephant is so amazing, that it can only be known from experience. I have seen an elephant carry on his tusks two can-*

makes a breach in a wall; that, though tremendous in strength, he is rendered still more invincible by his enormous mass, and by the thickness of his skin; that he can carry on his back an armed tower filled with many warriors; that he works machines, and carries burdens which six horses are unable to move; that to this prodigious strength he adds courage, prudence, coolness, and punctual obedience; that he preserves moderation even when in his most violent passions; that he is constant and impetuous in love*; that, when in anger, he mistakes not his friends; that he never attacks any but those who offend him; that he remembers favours as long as injuries; that, having no appetite for flesh, he feeds on vegetables alone, and is born an enemy to no living creature; and, in fine, that he is universally beloved, because all animals respect, and none have any reason to fear him.

Men likewise, in all ages, have had a kind of veneration for this first and grandest of terrestrial creatures. The ancients regarded him as a miracle of Nature; and, indeed, he is her highest

nons, fixed together with cables, each weighing 3,000 pounds, which he first raised from the ground, and then carried them to the distance of 500 paces. I have also seen an elephant draw ships and galleys upon land, in order to set them afloat. *Voyages de Fr. Pyrard*, tom. ii. p. 356.

* Nec adulteria noverè, nec ulla propter fœminas inter se prælia, cæteris animalibus pernicialia, non quia desit illis amoris vis, &c. — *Plin.* lib. viii. cap. 5. 'Mas quam impleverit coitu, eam amplius non tangit. — *Aristot. Hist. Anim.* lib. ix. cap. 49.

effort. But they have greatly exaggerated his faculties. They have, without hesitation, ascribed to him intellectual powers and moral virtues: Pliny, Ælian, Solinus, Plutarch, and other authors of a more modern date, have given to these animals rational manners, a natural and innate religion *, a kind of daily adoration of the sun and moon, the use of ablution before worship, a spirit of divination, piety towards heaven and their fellow creatures, whom they assist at the approach of death, and after their decease bedew them with tears, cover them with earth, &c. The Indians, prejudiced with the notion of the metempsychosis, or transmigration of souls, are still persuaded that a body so majestic as that of the

* *Hominum indigenarum linguam elephanti intelligunt. —Ælian. lib. iv. cap. 24. : . . Luna nova nitescente, audio elephantos naturali quadam et ineffabili intelligentia e silva, ubi pascuntur, ramos recens decerptos auferre, eosque deinde in sublime tollere, ut suspicere, et leviter ramos movere, tanquam supplicium quoddam Deæ protendentes, ut ipsis propria et benevola esse vellit. —Ælian. lib. iv. cap. 10. Elephas est animal proximum humanis sensibus. . . . Quippe intellectus illis sermonis patrii et imperiorum obedientia, officiorumque, quæ didicere, memoria, amoris et gloriæ voluptas: imo vero, quæ etiam in homine rara, probitas, prudentia, æquitas, religio quoque siderum, solisque ac lunæ veneratio. Autores sunt, nitescente luna nova, greges eorum descendere; ibique se purificantes solemniter aqua circumspergi, atque ita solutato sidere, in silvas reverti. . . . Visique sunt fessi ægritudine, herbas supini in cælum jacentes, veluti tellure precibus allegata. —Plin. *Hist. Nat.* lib. viii. cap. 1. Se abluunt et purificant, dein adorant solem et lunam. — Cadavera sui generis sepeliunt. — Lamentant, ramos et pulverem injiciunt supra cadaver. — Sagittas extrahunt tanquam Chirurgi periti. — Plin. Ælian. Solin. Tzetzes, &c.*

elephant must be animated with the soul of a great man or a king. In Siam *, Laos, Pegu †, &c., the white elephants are regarded as the living *manes* of the Indian emperors. Each of these

* M. Constance conducted the ambassador to see the white elephant which is so esteemed in India, and has given rise to so many wars. He is very small, and so old that he is all wrinkled. Several mandarins are appointed to take care of him, and his victuals are served up to him in large golden vessels. His apartment is magnificent, and the inside of it is handsomely gilded. — *Premier Voyage du P. Tachard*, p. 239. In a country house belonging to the king, situated upon the river about a league from Siam, I saw a small white elephant, which was destined to be successor to the one in the palace, which is said to be three hundred years old. This little elephant is somewhat larger than an ox, and is attended by many mandarins; and, out of respect to him, his mother and aunt are kept along with him. — *Idem*, p. 273.

† When the king of Pegu walks abroad, four white elephants, adorned with precious stones and ornaments of gold; march before him. — *Recueil des Voyages de la Compagnie des Indes de Hollande*, tom. iii. p. 43. . . . When the king of Pegu gives audience, the four white elephants are presented to him, who do him reverence by raising their trunks, opening their mouths, making three distinct cries, and then kneeling. When raised, they are led back to their stables, and are separately fed in large golden vessels. They are twice a day washed with water taken from a silver vessel. . . . During the time of their being dressed in this manner, they are under a canopy supported by eight domestics, in order to defend them from the heat of the sun. In going to the vessels which contain their food and water, they are preceded by three trumpets, and march with great majesty, regulating their steps by music, &c. — *Idem*. tom. iii. p. 40. White elephants are held to be sacred by the natives of Pegu: having learned that the king of Siam had two, they sent ambassadors offering any price that should be demanded for them. But the king of Siam would not sell them. His majesty of

animals has a palace, a number of domestics, golden vessels filled with the choicest food, magnificent garments, and they are absolved from all labour and servitude. The emperor is the only personage before whom they bow the knee, and their salute is returned by the monarch. By all these attentions, honours, and marks of respect, they are flattered, but not corrupted. This circumstance alone should be sufficient to convince the Indians, that these animals are not endowed with human souls.

After removing the fabulous credulities of antiquity, and the puerile fictions of superstition, which still exist, the elephant, even to philosophers, possesses enough to make him be regarded as a being of the first distinction. He deserves to be known and to be studied. We shall, therefore, endeavour to write his history with impartiality. We shall first consider him in a state of Nature, when he is perfectly free and independent, and afterwards in a state of servitude, when the will of his master is partly the motive of his actions.

In a wild state, elephants are neither sanguinary nor ferocious. Their dispositions are gentle, and they make not a wrong use of their arms or their strength; for they never exert them but in defending themselves, or in protecting their companions. Their manners are social; for they are seldom seen wandering alone. They

Pegu, incensed at this refusal, came with his army, and not only carried off the elephants by force, but rendered the whole country tributary to him. — *Idem.* tom. ii. p. 223.

generally march in troops, the oldest keeping foremost *, and the next in age bringing up the rear. The young and the feeble are placed in the middle. The mothers carry their young firmly embraced in their trunks. They observe not this order, except in perilous marches, when they want to pasture on cultivated fields. In the deserts and forests they travel with less precaution, but without separating so far as to exceed the possibility of receiving assistance from one another. Some of them, however, occasionally wander, or lag behind the troop; and it is these alone whom the hunters dare attack; for a little army is necessary to assail a whole troop †; and they are never vanquished but at the expense of several lives. It is even dangerous to do them the smallest injury ‡; for they

* *Elephanti gregatim semper ingrediuntur; ducit agmen maximus natu, cogit ætate proximus. Amnes transituri minimos præmittunt, ne majorum incessu atterente alveum, crescat gurgitis alitudo.* — *Plin. Hist. Nat. lib. viii. cap. 5.*

† I still tremble when I think of the danger to which we exposed ourselves in pursuing a wild elephant; for, though there were only ten or a dozen of us, the one half of which were not well armed, if we could have come up with him, we should have been foolish enough to make the attack. We thought we might kill him by two or three shot. But I afterwards saw that this business requires two or three hundred men. — *Voyage de Guinée, par Guillaume Bosman, p. 436.*

‡ Solent elephanti magno numero confertim incedere, et si quemdam obvium habuerint, vel devitant, vel illi cedunt; at si quemdam injuria afficere velit, proboscide sublatum in terram dejicet, pedibus deculcans donec mortuum reliquerit. — *Leonis Africani Descript. Africa, p. 744.* The Negroes unanimously relate, that the elephants, when they

run straight upon the offender, and, though the weight of their bodies be great, their steps are so long, that they easily overtake the most agile man. They then transfix him with their tusks, or, laying hold of him with their trunk, throw him against a stone, and put an end to his existence by trampling him under their feet. But it is when provoked only that they kill men in this manner, and never injure those who do not disturb them. But as they are extremely suspicious and sensible of injuries, it is proper to avoid them; and the travellers who frequent the countries inhabited by elephants, kindle fires during the night, and beat drums to prevent their approach. When they have been once attacked by men, or have fallen into a snare, they are said never to forget it, but take every opportunity of revenge *. As

meet any person in the woods, do him no harm, unless they are attacked; but that, when shot at, and not mortally wounded, they become extremely furious. — *Voyage de Guinée, par Bosman*, p. 245. The wild elephant is provoked to pursue a man, and is then caught in a pit-fall. — *Journal du Voyage de Siam, par l'Abbé de Choisy*, p. 242. Those who hurt or insult an elephant, should be much on their guard; for these animals do not easily forget injuries, until they accomplish their revenge. — *Recueil des Voyages de la Compagnie des Indes de Hollande*, tom. i. p. 413.

* We have the authority of a late intelligent observer, Mr. Corse, to say that this assertion is not quite correct. A residence of more than ten years in Tiperah, a province of Bengal; where herds of elephants are taken every season, afforded Mr. Corse frequent opportunities of observing, not only the methods of taking them, but also the habits and manners of this noble animal. He has published different accounts relating to the elephant in the Asiatic Researches, and in the

their sense of smelling is, perhaps, more perfect than that of any other animal, the smell of a

Philosophical Transactions; from which last work, for the year 1799, the following fact is extracted :

“ A female elephant was taken with a herd of many others, in the year 1765, by rajah Kishun Maunick, who, about six months after, gave her to Abdoor Rezah, a man of some rank and consequence in the district. In 1767, the rajah sent a force against this Abdoor Rezah, for some refractory conduct; who, in his retreat to the hills, turned her loose into the woods, after having used her above two years as a riding elephant. In January, 1770, she was retaken by the rajah; but in April, 1771, she broke loose from her pickets in a stormy night, and escaped to the hills. On the 25th of December, 1782, she was driven by Mr. Leeke's elephant hunters into a *keddah*; and, the day following, when Mr. Leeke went to see the herd that had been secured, this elephant was pointed out to him by the hunters, and particularly by a driver who had had charge of her for some time, and well recollected her. They frequently called to her by name, to which she seemed to pay some attention, by immediately looking towards them when her name *Juggut-peauree* was repeated; nor did she appear like the wild elephants, which were constantly running about the *keddah* in a rage, but seemed perfectly reconciled to her situation. From the 25th of December to the 13th of January (a space of eighteen days), she never went near enough the outlet (or *roomee*) to be secured; from a recollection, perhaps, of what she had twice before suffered: Orders, however, had been given not to permit her to enter the outlet, had she been so inclined, as Mr. Leeke wished to be present when she was taken out of the *keddah*. On the 13th of January, 1783, Mr. Leeke went out, when there were only herself, another female, and eight young ones remaining in the enclosure. After the other female had been secured by one of the *koomkees* sent in for that purpose, the hunters were ordered to call *Juggut-peauree*. She immediately came to the side of the ditch, within the enclosure; on which, some of the drivers were desired to carry

man strikes them at a great distance, and they can easily follow him by the scent. The ancients

in a plantain-tree, the leaves of which she not only took from their hands with her trunk, but opened her mouth for them to put a leaf into it; which they did, stroking her, caressing her, and calling to her by name. Mr. Leeke, seeing the animal so tame, would not permit the hunters to attempt tying her; but ordered one of the trained elephants to be brought to her, and the driver to take her by the ear and order her to lie down. At first, she did not like the *koomkee* to go near her, and retired to a distance, seemingly angry; but when the drivers, who were on foot, called to her, she came immediately, and allowed them to stroke and caress her as before; and in a few minutes after permitted the trained females to be familiar. A driver from one of these then fastened a rope round her body, and instantly jumped on her back; which at the moment she did not like, but was soon reconciled to it. A small cord was next fastened round her neck for the driver to put his feet in; who, seating himself on the neck in the usual manner, drove her about the *keddah*, the same as any of the tame elephants.

"After this, he ordered her to lie down, which she instantly did; nor did she rise till she was desired. He fed her from his seat, gave her his stick to hold, which she took with her trunk and put into her mouth, kept and then returned it, as she was directed, and as she formerly had been accustomed to do. In short, she was so obedient, that, had there been more wild elephants in the *keddah* to tie, she would have been useful in securing them. Mr. Leeke himself then went up, took her by the ear, and bade her lie down; a command she instantly obeyed."

Mr. Corse was himself a witness both of the escape and retaking of one, as related in the following account:

"In June, 1787, *Jáutra-mungul*, a male elephant, taken the year before, was travelling in company with some other elephants, towards Chittigong, laden with a tent and some baggage for the accommodation of Mr. Buller and myself on the journey. Having come upon a tiger's track, which elephants

relate, that the elephants tear the grass off the ground upon which the hunters had passed, and

discover readily by the smell, he took fright and ran off to the woods, in spite of the efforts of his driver. On entering the wood, the driver saved himself by springing from the elephant, and clinging to the branch of a tree, under which he was passing: when the elephant had got rid of his driver, he soon contrived to shake off his load. As soon as he ran away, a trained female was dispatched after him, but could not get up in time to prevent his escape: she, however, brought back his driver, and the load he had thrown off, and we proceeded, without any hope of ever seeing him again.

“Eighteen months after this, when a herd of elephants had been taken, and had remained several days in the enclosure, till they were enticed into the outlet, there tied, and led out in the usual manner, one of the drivers, viewing a male elephant very attentively, declared that he resembled the one which had run away. This excited the curiosity of every one to go and look at him; but when any person came near, the animal struck at him with his trunk, and, in every respect, appeared as wild and outrageous as any of the other elephants. At length, an old hunter, coming up and examining him narrowly, declared he was the very elephant that had made his escape about eighteen months before.

“Confident of this, he boldly rode up to him on a tame elephant, and ordered him to lie down, pulling him by the ear at the same time. The animal seemed quite taken by surprise, and instantly obeyed the word of command, with as much quickness as the ropes with which he was tied permitted; uttering at the same time a peculiar shrill squeak through his trunk, as he had formerly been known to do; by which he was immediately recognised by every person who had ever been acquainted with this peculiarity.

“Thus we see that this elephant, for the space of eight or ten days, during which he was in the *keddah*, and even while he was tying in the outlet, appeared equally wild and fierce as the boldest elephant then taken; so that he was not even suspected of having been formerly taken, till he was conducted

that they hand it about to each other for the purpose of receiving information concerning the passage and march of the enemy. These animals love the banks of rivers*, deep valleys, and shady moist places. They cannot dispense with water, which they trouble before they drink. They often fill their trunk with water, either to carry it to their mouth, or solely for refreshing their nose, and amusing themselves by throwing it back into the river, or besprinkling it around. They cannot support cold, and likewise suffer by extreme heat. To avoid the ardor of the sun's rays, they retire into the most shady recesses of the forests. They frequently take to the water: the enormous size of their bodies rather aids than retards their swimming; for they sink not proportionably so deep as other animals; and the length of their trunk, which they hold up in the air, and through which they respire, removes from them all apprehensions of being drowned.

Roots, herbs, leaves, and tender wood, are

from the outlet. The moment, however, he was addressed in a commanding tone, the recollection of his former obedience seemed to rush upon him at once; and, without any difficulty, he permitted a driver to be seated on his neck, who in a few days made him as tractable as ever."

These and several other instances which have occurred, clearly evince that elephants have not the sagacity to avoid a snare into which they have, even more than once, fallen.

W.

* *Elephanti naturæ proprium est roscida loca et mollia amare et aquam desiderare, ubi versari maxime studet; ita ut animal palustre nominari possit. — Ælian., lib. iv. cap. 24.*

their common food. They likewise eat grains and fruits. But they disdain flesh and fish*. When one of them discovers a plentiful pasture, he calls to the others, and invites them to eat with him†. As they require a vast quantity of forage, they often change their place of pasturing: and, when they come upon cultivated fields, they do incredible damage. Their bodies being of an enormous weight, they destroy ten times more with their feet than they use for food, which generally amounts to 150 pounds of grass a day; and, as they always go in troops, they lay a whole country waste in a single hour. For this reason, the Indians and Negroes use every artifice to prevent the approach of these animals, or to fright them away. They make great noises, and kindle large fires round their cultivated fields. But, notwithstanding these precautions, the elephants sometimes pay them a visit, drive off the domestic cattle, put the men to flight, and, not unfrequently, overturn their limber habitations. It is difficult to scare them; and they are not susceptible of fear. Nothing can surprise them, or stop their progress, but ar-

* The most savage of these animals eat no flesh, but live solely upon leaves, branches, and twigs of trees, which they break off with their trunk, and even browse pretty strong wood. — *Voyage de Fr. Pyrard*, tom. ii. p. 367.

† Cum eis cætera pabula defecerint, radices effodiunt, quibus pascuntur; e quibus primus qui aliquam prædam repererit, regreditur ut et suos gregales advocet, et in prædæ communionem deducat. — *Ælian*, lib. ix. cap. 56.

tificial fires*, or crackers, which the natives throw at them, and the sudden and repeated noise sometimes induces them to turn back. It is not easy to make them separate from each other; for they generally act in concert, whether they attack, march, or fly. *

When the females come in season, this attachment to society yields to a stronger passion. The troop separates into pairs, which love had previously formed. They unite from choice, steal off in quest of retirement, and their march seems to be preceded by love, and followed by modesty; for all their pleasures are accompanied with the profoundest mystery. They have never been detected in their amours. They anxiously avoid the presence or inspection of their neighbours; and know, perhaps, better than the human race, how to enjoy pleasure in secret, and to be entirely occupied with a single object. They search for the deepest solitudes of the woods, that they may give full vent, without disturbance or reserve, to all the impulses of Nature †.

* When the elephant is enraged, nothing stops his career but artificial fires. When fighting, the same means are employed to disengage them from the combat. — *Relat. par Thevenot*, tom. iii. p. 133. The Portuguese know no other mode of defending themselves against the elephant, but by throwing squibs or torches in his eyes. — *Voyage de Feynes*, p. 89. — In the Mogul empire, elephants are made to combat with each other. They fight so obstinately, that they can only be separated by throwing artificial fires between them. — *Voyage de Bernier*, tom. ii. p. 64.

† *Elephanti solitudines petunt coituri, et præcipue secus*

which are lively and durable, in proportion to the long interval of abstinence. The female goes with young two years *: when impregnated, the male abstains; and his season of love returns but once in three years. The females produce only one young †, which, at the moment of birth, has teeth ‡, and is as large as a wild boar. There is no appearance, however, of the horns or tusks. Soon after, they begin to shoot; and, at the age of six months, they are several inches long § ||. The animal is then larger than an ox, and the tusks continue to grow and enlarge till the most advanced age, provided the creature enjoys health and liberty; for it is not to be ima-

flumina.—*Arist. Hist. Anim.* lib. 5. cap. 1. Pudore nunquam nisi in abdito coeunt.—*Plin.* lib. viii. cap. 5.

* Mas coitum triennio interposito repetit. Quam gravidam reddidit, eandem præterea tangere nunquam patitur. Uterum biennio gerit.—*Arist. Hist. Anim.* lib. 5. cap. 14. Elephantus biennio gestatur, propter exuperantiam magnitudinis.—*Idem. de Generat. Anim.* lib. iv. cap. 10.

† Quæ maxima inter animalia sunt, ea singulos pariunt, ut elephas, camelus, equus.—*Ibid.* lib. iv. cap. 4.

‡ Statim cum natus est elephantus dentes habet, quanquam grandes illos (dentes) non illico conspicuos obtinet.—*Ibid.* lib. ii. cap. 5.

§ Thomas Lopes, apud Gesnerum, cap. de Elephanto.

|| Mr. Corse informs us, that the first, or milk tusks of an elephant, never grow to any considerable size, but are shed between the first and second year, when not two inches in length. The time when they cut the gum varies considerably. Sometimes a young elephant has his tusks at five months old, and sometimes not till seven. * Even in a fœtus, which has arrived at its full size, these deciduous tusks are formed.

gined what changes may be introduced into the temperament and habits of the elephant by slavery and unnatural food. They are easily tamed, instructed, and rendered submissive; and, as they are stronger and more intelligent than any other animal, their service is more ready, more extensive, and more useful. But the disgust arising from their situation is probably never eradicated: for, though they feel, from time to time, the most lively impressions of love, they neither intermix nor produce in a domestic state. Their constrained passion degenerates into fury. Being unable to gratify themselves without witnesses, they fret, lose patience, and, at last, their indignation becomes so violent, that the strongest chains, and fetters of every kind, are necessary to repress their movements, and to allay their rage. Hence they differ from all other domestic animals, who are managed by men as if they had no will of their own. They are not of the number of those born slaves, which we propagate, mutilate, or multiply, purely to answer our own purposes. Here the individual alone is a slave. The species remain independent, and uniformly refuse to augment the stores of their tyrants. This circumstance shows the elephant to be endowed with sentiments superior to the nature of common brutes. To feel the most ardent passion, and, at the same time, to deny the gratification of it; to experience all the fury of love, and not to transgress the laws of modesty; are, perhaps, the highest efforts of human virtue; and yet, in these majestic animals, they

are only common and uniform exertions. The indignation they feel, because they cannot be gratified in secret, becomes stronger than the passion of love, suspends and destroys the effects of it, and, at the same time, excites that fury, which, during these paroxysms, renders them more dangerous than any wild animal.

We are inclined, were it possible, to doubt of this fact; but all naturalists, historians, and travellers, concur in assuring us, that the elephants never produce in a domestic state*. The princes of India keep great numbers of elephants; and, after many fruitless attempts to multiply them like other domestic animals, they found it necessary to separate the males from the females, in order to diminish the frequency of those ineffectual ardours, which are always accompanied with fury. Hence there are no domestic elephants which have not formerly been wild; and the manner of taking, taming, and rendering them submissive †, merits particular atten-

* It is remarkable, that the male never covers the female, though she indicates the strongest mark of desire, in situations where they may be exposed to the observation of men.—*Voyage de Fr. Peyrard*, p. 357. The elephants never couple but in secret, and produce only one at a birth.—*Cosmographie du Levant, par Thevet*, p. 70.

† I went to see the grand hunting of the elephants, which was performed in the following manner: The king sent a great number of women into the woods; and, when the report was brought that they had discovered a troop of elephants, he dispatched thirty or forty thousand men, who made a large circle round the place. They posted themselves in fours, at the distance of twenty or twenty-five feet from

tion. In the midst of the forest, and in the neighbourhood of places frequented by the elephants, a spot is chosen, and surrounded with strong pallisades. The largest trees of the wood serve as the principal stakes, to which are fixed cross bars that support the other stakes. A large opening is left, through which the elephant may enter; and over this door there is a trap, or ra-

each other, and at every station they kindled a fire, which was raised about three feet above the surface of the earth. There was another circle composed of elephants trained to war, distant from one another about a hundred or a hundred and fifty paces; and, in such places as the wild elephants might most easily escape, the war elephants were posted closer. There were cannons in several places, which are discharged when the wild elephants attempt to force a passage; for they are terrified at fire. This circle is daily diminished, and at last becomes so small, that the fires are not above five or six paces distant. As the elephants hear a great noise all round them, they dare not fly, though it is not uncommon for some of them to make their escape; for I was told that ten of them got off in one day. When the hunters want to seize them, they are made to enter a place surrounded with stakes, where there are also some trees, between which a man can easily pass. There is another circle of war elephants and soldiers, into which some men enter mounted on elephants, who are extremely dexterous in throwing ropes round the hind-legs of these animals. When fixed in this manner, the wild elephant is put between two tame elephants, and a third one is appointed to push him behind in such a manner, as obliges him to go forward; and, when he grows mischievous, the others give him blows with their trunks. He is then led off into captivity; and the others are seized in the same manner. I saw ten of them taken. The king was present, and gave every necessary order.—*Relation de la l'Ambassade de M. Chevalier de Chaumont à la Cour du Roi de Siam*, p 91.

ther it receives a strong bar, which is shut after the animal passes. To draw him into this enclosure, the hunters go in quest of him; they carry along with them into the forest a tamed female in season; and, when they imagine themselves to be near enough to be heard, her governor makes her utter the cry of love. The wild male instantly replies, and hastens to join her. She is then made to march towards the enclosure, repeating the cry from time to time. She arrives first; and the male, following her by the scent, enters by the same port. As soon as he perceives the hunters, and sees himself surrounded, his ardour vanishes, and is changed into fury. Ropes and fetters are thrown round his legs and trunk. Two or three tamed elephants, conducted by men expert in that business, are brought to him, and they endeavour to fix him to one of these animals. In fine, by address, by force, by torture, and by caresses, he is tamed in a few days. I will not enter into a more particular detail, but content myself with quoting from those travellers who have been eye-witnesses of the hunting of elephants * †,

* At a quarter of a league from Luovo, there is a kind of large amphitheatre, of a rectangular figure, surrounded with high terrace walls, upon which the spectators are placed. Within these walls, there is a pallisade of strong posts fixed in the ground, behind which the hunters retire when pursued by the enraged elephants. A large opening is left on the side next the fields, and opposite to it, next the city, there is a smaller one, which leads to a narrow alley, through which

which differs in different countries, and according to the strength and dexterity of the people

an elephant can pass with difficulty, and this alley terminates in a large shade, where the operation of taming is finished.

When the day destined for the chase arrives, the hunters enter the woods, mounted on female elephants trained to this exercise. The men cover themselves with leaves of trees, to prevent their being observed by the wild elephants. When they have advanced into the forests, and think that some elephants may be in the neighbourhood, they make the females utter certain cries, fitted to allure the males, who instantly reply by frightful roarings. Then the hunters, when they perceive the elephants at a proper distance, return, and lead the females gently back toward the amphitheatre above described. The wild elephants never fail to follow. The male, which we saw tamed, entered the enclosure spontaneously along with the females, and the passage was immediately shut. The females continued their march across the amphitheatre, and filed off one by one into the narrow alley at the other end. The wild elephant, who had followed them all along, stopt at the entrance of this defile. Every method was tried to make him enter. The females, who were now beyond the alley, were made to cry. Some Siamese irritated him, by clapping their hands, and crying *pat, pat*. Others tease him with long poles armed with sharp points; and, when pursued, they slip through between the posts, and conceal themselves behind the pallisade, which the elephant cannot surmount. Lastly, after having pursued several hunters in vain, he singles out one, whom he sets upon with extreme fury. This man runs into the narrow alley, and the elephant follows him. But he no sooner enters, than he perceives himself to be in a snare; for the man escapes, and two portcullises, one before and another behind, are instantly let fall; so that, being unable either to advance or retreat, the animal makes the most astonishing efforts, and raises the most hideous cries. The hunters endeavour to sooth him by throwing pails of water on his body, by rubbing him with leaves, by

who make war against them; for, instead of making, like the king of Siam, walls, terraces,

pouring oil upon his ears, and by bringing to him tamed elephants, both male and female, who caress him with their trunks. They fix ropes, however, round his body and hind-legs, to enable them to drag him out, and they continue to throw water on his trunk and body, in order to refresh him. In fine, a tamed elephant, accustomed to instruct noviciates, is made to approach him. The former is mounted by a servant, who makes the animal advance and retire, to show the wild elephant that he has nothing to fear, and that he may go out. The port is then opened, and he follows his neighbour to the end of the alley. When there, two elephants are tied, one to each side of him, another marches before, leads him in the way they want him to go, while a third pushes him behind with its head, till they arrive at a kind of shade, where he is tied to a large post, which turns round like the capstan of a ship. There he is left till next day, to allow his rage to subside. But, while he frets around this post, a Bramin, one of those Indian priests who are extremely numerous in Siam, dressed in white, approaches the animal, mounted on an elephant, turns gently round him, and bedews him with a consecrated water, which the priest carries in a golden vessel. They believe that, by this ceremony, the elephant loses his natural ferocity, and is rendered fit for the king's service. Next day, he walks along with his enslaved neighbours; and, at the end of fifteen days, he is completely tamed. — *Prenier Voyage du P. Tachard*, p. 298.

They had no sooner alighted from their horses, and mounted the elephants which were prepared for them, than the king appeared, accompanied with a great number of mandarins, riding on elephants of war. They all proceeded about a league into the wood, when they arrived at the place where the wild elephants were enclosed. This was a square park, of three or four hundred geometrical paces, the sides of which were fenced with large stakes; in which, however, considerable openings were left at certain distances. It contained fourteen large elephants. As soon as the royal train

pallisades, parks, and vast enclosures, the poor Negroes content themselves with the most simple

arrived, a circle was formed, consisting of a hundred war elephants, which were placed round the park to prevent the wild ones from forcing through the pallisades. We were stationed behind this fence, near the king. A dozen of the strongest tame elephants were pushed into the park, each of them being mounted by two men, furnished with large ropes and nooses, the ends of which were fixed to the elephants they rode. They first ran against the elephant they wished to seize, who, seeing himself pursued, endeavoured to force the barrier and make his escape. But the whole was blockaded by the war elephants, who pushed him back; and, in his course, the hunters, mounted on the tame elephants, threw their nooses so dexterously upon the spots where it behoved the animal to place his feet, that the whole were seized in the space of an hour. Each elephant was then bound with ropes, and two tame ones placed on each side of him, by means of which he is tamed in fifteen days.—*Idem*, p. 340.

A few days after, we had the pleasure of being present at the hunting of elephants. The Siamese are very dexterous at this species of hunting, which they have several modes of performing. The easiest, and not the least entertaining, is executed by means of the female elephants. When a female is in season, she is conducted to the forest of Luovo. Her guide rides on her back, and covers himself with leaves, to prevent his being perceived by the wild elephants. The cries of the tame female, which she never fails to set up upon a certain signal given by the guide, collect all the elephants within the reach of hearing, who soon follow her. The guide, taking advantage of their mutual cries, returns slowly towards Luovo with all his train, and enters an enclosure made of large stakes, about a quarter of a league from the city, and pretty near the forest. A great troop of elephants were, in this manner, brought together; but one of them only was large, and it was very difficult to seize and to tame him.—The guide who conducted the female, went out of the enclosure by a narrow passage in the form of an alley, and

artifices. They dig†, in the places where the elephants are supposed to pass, ditches so deep,

about the length of an elephant. Each end of this alley was provided with a portcullis, which was easily raised or let down. All the young elephants followed the female at different times. But a passage so narrow alarmed the large one, who always drew back. The female was made to return several times; he uniformly followed her to the port; but, as if he foresaw his loss of liberty, he would never pass. Several Siamese, who were in the park, then advanced and endeavoured to force him, by goading him with sharp pointed poles. The elephant, being enraged by this treatment, pursued them with such fury and quickness, that not one of them would have escaped, had they not nimbly retired behind the stakes of the pallisade, against which the ferocious creature broke its large tusks three or four times. In the heat of the pursuit, one of those who attacked him most briskly, and who was most keenly pursued, ran into the alley, which the elephant entered in order to kill him. But the animal no sooner fell into the snare, than the Siamese escaped by a small passage, and the two portcullises were instantly let down. The elephant struggled much; but he found himself obliged to remain in his prison. To appease him they threw pailfuls of water on his body. Ropes, however, were put round his legs and neck. After being fatigued for some time, he was brought out by means of two tame elephants, who drew him forward with ropes, while other two pushed him behind, till he was fixed to a large post, round which he could only turn. In an hour after he became so tractable, that a Siamese mounted on his back; and next day he was let loose, and conducted to the stables along with the others.—*Second Voyage du P. Tachard*, p. 352.

† For a particular account of elephant hunting, see Bruce's Travels, and the Asiatic Annual Register for 1804. The mode of securing the wild elephants for domestic purposes, is amply detailed, by Mr. Corse, in the Asiatic Researches.

IV.

‡ Though these animals be large and savage, great num-

that, after falling into them, there is no possibility of getting out.

The elephant, when tamed, becomes the most

bers of them are taken in Æthiopia by the following stratagem: in the thickest parts of the forest, where the elephants retire during the night, an enclosure is made of stakes, interlaced with large branches, in which a small opening is left, which has a door lying flat on the ground. When the elephant enters, the hunters, from the top of a tree, draw up the door by means of a rope. They then descend and slay the animal with arrows. But if, by accident, they miss their aim, and the creature escapes from the enclosure, he kills every man he meets. — *L'Afrique de Marmol*, tom. i. p. 58. There are different modes of hunting elephants. In some places, caltrops are spread on the ground, by means of which the animals fall into ditches, from whence, after being properly entangled, they are easily drawn out. In others, a tame female is led into a narrow defile, and allures the male to approach by her cries. When he arrives, the hunters shut him up by barriers, which they have in readiness for the purpose; and though he finds the female on her back, he copulates with her, contrary to the practice of other quadrupeds. After this, he endeavours to retire. But, while he goes about in quest of an outlet, the hunters, who are upon a wall, or some elevated situation, throw ropes and chains of different dimensions, by which they so entangle his trunk and the rest of his body, that they can approach him without danger; and, after taking some necessary precautions, they carry him off, accompanied with two tame elephants, to show him a proper example, or to chastise him if he rebels. — There are many other methods of hunting elephants; for every country has its own mode. — *Relation d'un Voyage par Tavernier*, tom. iii. p. 131. The inhabitants of Ceylon dig pretty deep ditches, which they cover with thin planks and straw. During the night, the elephants having no suspicion of the deceit, come upon the planks, and fall into the ditch, from which they are unable to escape, but would infallibly perish by hunger, if victuals were not brought to them by slaves, to

gentle and most obedient of all domestic animals. He is so fond of his keeper, that he caresses him, and anticipates his commands, by foreseeing every thing that will please him. He soon learns to comprehend signs, and even to understand the expression of sounds. He distinguishes the tones of command, of anger, or of approbation, and regulates his actions accordingly. He never mistakes the voice of his master. He receives his orders with attention, executes them with prudence and eagerness, but without any degree of precipitation; for his movements are always

whom they gradually become accustomed, and at last are rendered so tame, that they are brought to Goa, and other adjacent countries, to gain their own livelihood and that of their masters.—*Divers Memoires touchant les Indes Orientales, premier discours*, tom. ii. p. 257.—*Recueil des Voyages de la Compagnie des Indes, Amst.* 1711. As the Europeans give a high price for elephants' teeth, the love of gain arms the Negroes perpetually against these animals. For this species of hunting they sometimes assemble in great bodies, with their arrows and darts. But the most common and most successful method is that of digging ditches in the woods, because they are never deceived in distinguishing the track of the elephants.—There are two methods of taking these animals, either by digging ditches and covering them with the branches of trees, into which the creatures inadvertently fall, or by hunting them, which is performed in the following manner. In the island of Ceylon, where the elephants are very numerous, the hunters keep female elephants, which they call *alias*. As soon as they learn that there are wild elephants in any place; they repair thither, accompanied with two of these *alias*, which, whenever a male is discovered, they let loose. The females come up on each side of him, and keeping him in the middle, squeeze him so hard that he cannot escape.—*Voyage d'Orient. du P. Philippe de la tres-sainte Trinite*, p. 361.

measured, and his character seems to partake of the gravity of his mass. He easily learns to bend his knees for the accommodation of those who mount him. His friends he caresses with his trunk, salutes with it such people as are pointed out to him, uses it for raising burdens, and assists in loading himself. He allows himself to be clothed, and seems to have a pleasure in being covered with gilded harness and brilliant housings. He is employed in drawing chariots*, ploughs, waggons, &c. He draws equally, and never turns restive, provided he is not insulted with improper chastisement, and the people who labour with him have the air of being pleased with the manner in which he employs his strength. The man who conducts the animal generally rides on his neck, and uses an iron rod†, hooked at the end, or a bodkin, with which

* I was an eye witness to the following facts. At Goa, there are always some elephants employed in the building of ships. One day went to the side of the river, near which a large ship was building in the city of Goa, where there is a large area filled with beams for that purpose. Some men tie the ends of the heaviest beams with a rope, which is handed to an elephant, who carries it to his mouth, and after twisting it round his trunk, draws it, without any conductor, to the place where the ship is building, though it had only once been pointed out to him. He sometimes drew beams so large, that more than twenty men would have been unable to move. But what surprised me still more, when other beams obstructed the road, he elevated the ends of his own beams, that they might run easily over those which lay in his way. Could the most enlightened man do more? — *Voyage d'Orient. du P. Philippe de la très-sainte Trinité, p. 367.*

† The conductor rides on the elephant's neck, and uses no bridle, reins, or any kind of stimulus, but only a large iron rod, sharp and hooked at the end, with which he spurs on the

he pricks the head or sides of the ears, in order to push the creature forward, or to make him turn. But words are generally sufficient *, especially if the animal has had time to acquire a complete acquaintance with his conductor, and to put entire confidence in him. The attachment of the elephant becomes sometimes so strong, and his affection so warm and durable, that he has been known to die of sorrow, when, in a paroxysm of rage, he had killed his guide †.

Though the elephant produces but a single young one in two or three years, the species is very numerous. The prolific powers of animals are proportioned to the shortness of their lives. In elephants the duration of life compensates their sterility ; and, if it be true that they live two centuries, and can propagate till they are one hundred and twenty years old, each couple may produce forty in this period. Besides, as they have nothing to fear from other animals,

animal, and likewise directs the way, by pricking his ears, muzzle, and other places that have most sensibility. This rod, which would kill any other animal, is hardly sufficient to make an impression on the skin of the elephant, or to keep him in subjection when irritated. — *Voyage de Pietro della Valle*, tom. iv. p. 247. Two servants, the one mounted on the neck, and the other on the crupper, manage the elephant, by means of a large iron hook. — *Premier Voyage du P. Tachard*, p. 273.

* Non fitæno aut habenis aut aliis vinculis regitur bellua, sed insidentis voci obsequitur. — *Vartoman. apud Gesner. cap. de Elephanto.*

† Quidam iracundia permotus cum cessorem suum occidisset, tam valde desideravit, ut, pœnitundine et mœrore confectus, obierit. — *Arrianus in Indicis.*

and are taken with much difficulty and hazard by men, the species is easily supported, and is generally diffused over all the southern regions of Africa and Asia. Elephants abound in Ceylon*, in the Mogul empire†, in Bengal‡, in Siam§, in Pegu||, and in all the other territories of India. They are, perhaps, still more numerous in all the southern regions of Africa, except certain cantons which they have abandoned, be-

* In Ceylon there are many elephants, whose teeth bring much riches to the inhabitants.—*Voyage de Fr. Peyrard*, tom. ii. p. 151. There are vast numbers of elephants in India, most of which are brought from the island of Ceylon.—*Voyage de la Boullaye-le-Gouz*, p. 250. At Deli, as well as other parts of India, there are different kinds of elephants; but those brought from Ceylon are preferred to all the rest.—*Relation d'un Voyage, par Thevenot*, tom. iii. p. 131. In the island of Ceylon there are many elephants, and they are more generous and noble than those of other countries.—*Voyage d'Orient, du P. Philippe*, p. 351.—*Recueil des Voyages qui ont servi à l'Etablissement de la Compagnie des Indes de Holland. Les Voyages de Tavernier*, tom. iii. p. 237.

† Voyage de Fr. Bernier au Mogul, tom. ii. p. 64; Voyage de Feynes à la Chine, p. 89; Relation d'un Voyage, par Thevenot, tom. iii. p. 131; Voyage d'Edward Terei, aux Indes Orientales, p. 15.

‡ The country of Bengal abounds in elephants; and it is from thence they are conveyed to the other parts of India.—*Voyage de Fr. Peyrard*, tom. i. p. 353.

§ M. de Constance informed me, that the king of Siam had twenty thousand elephants in his dominions, without reckoning those that are wild, and live in the woods and mountains, of which, fifty, sixty, and even eighty, are sometimes taken at a single hunting match.—*Premier Voyage du P. Tachard*, p. 288.

|| Recueil des Voyages de la Compagnie des Indes.—*Voyage de Vander Hagen*, tom. iii. p. 40, &c.

cause they are totally occupied by men. Elephants are faithful to their country, and never change their climate; for though they can live in temperate regions, yet they appear not to have ever attempted to establish themselves, or even to travel into these climates. They were formerly unknown in Europe. Homer, though he mentions ivory*, seems not to have been acquainted with the animal by which that substance is produced. Alexander the Great was the first European who ever mounted an elephant†. Those which he took from Porus, he caused to be brought to Greece; and they were, perhaps, the same which Pyrrhus‡, several years after, employed against the Romans in the Tarentine war, and with which Curius came triumphant into Rome. Annibal afterwards transported elephants from Africa, made them pass the Alps, and conducted them almost to the gates of Rome.

The Indians, from a period beyond the records of history, have employed elephants in war§.

* Herodotus is the most ancient author who mentions ivory to have been a matter derived from elephants' teeth.—*Vid. Plin. Hist. Nat. lib. viii. cap. 3.*

† *Elephantēs ex Europæis primus Alexander habuit, cum subegisset Porum.* — *Pausanias, in Atticis.*

‡ *Manius Curius Dentatus, victo Pyrrho, primum in triumpho elephantum duxit.* — *Seneca de Brevitate Vitæ, cap. 13.*

§ From time immemorial, the kings of Ceylon, of Pegu, and of Aracan, have used elephants in wars. Naked sabres were tied to their trunks, and on their backs were fixed small wooden castles, which contained five or six men armed with javelins and other weapons. They contributed greatly to dis-

Among these undisciplined nations, the elephants formed their best troop; and, as long as steel weapons alone were employed, they generally decided the fate of battles. We learn from history, however, that the Greeks and Romans were soon accustomed to these monsters of war. They opened their ranks to let them pass, and directed all their weapons, not against the animals, but their conductors, who used all their efforts to turn and appease those which had separated from the rest of the troop. Now that fire has become the element of war, and the chief instrument of death, elephants, which are terrified both at the noise and flame*, would be more dangerous than useful in our combats. The Indian kings still arm elephants in their wars; but this practice is designed more for show than utility. One advantage, however, is derived from them. Like every other military order, they serve the purpose of enslaving their equals, and are, accordingly, used in taming the wild elephants. The most powerful monarchs of India have not now above 200 war elephants†.

order the enemy; but they are easily terrified by the sight of fire. — *Recueil des Voyages de la Compagnie des Indes*, tom. vii. — *Voyage de Schouten*, p. 32.

* The elephants are afraid of fire; and, therefore, since the use of fire-arms, these animals are of no value in war. Some of those brought from Ceylon are not so dastardly; but it is only after being daily accustomed to the firing of guns, and to having crackers thrown among their feet. — *Voyage de Fr. Bernier*, tom. ii. p. 65.

† Few people in India have elephants. Even their nobles have not many; and the Great Mogul keeps not above five

They keep many others for the purposes of labour, and for transporting their women in large cages covered with foliage. It is a very safe mode of riding; for the elephant never stumbles: but to be accustomed to his brisk and swifling movements, requires time and practice. The neck is the best seat; for there the succussions are not so hard as on the shoulders, back, or crupper. But for the purposes of war or of hunting, each elephant is always mounted by several men*. The conductor rides astraddle on their neck, and the hunters or combatants sit on the other parts of the body.

In those happy regions where cannon, and other murdering engines, are imperfectly known, they still fight with elephants†. At Cochin,

hundred for his household, and for transporting his baggage and women, in wattled cages or baskets. I have been assured, that he has not above two hundred war elephants, part of which are employed in carrying small pieces of artillery. — *Relation d'un Voyage, par Théracot*, tom. iii. p. 192.

* Of all animals, the elephant is the most serviceable in war; for he can easily carry four men armed with muskets, bows, or spears. — *Recueil des Voyages de la Comp. des Indes de Hollande.* — *Second Voyage de Vander Hagen*, tom. ii. p. 53.

† When the elephants are led to war, they serve two purposes; for they either carry small wooden towers, from the top of which some soldiers fight, or they have swords fixed to their trunks with iron chains, and in this manner they are let loose against the enemy, whom they assail with courage, and would unquestionably cut to pieces, if they were not repelled by spears, which throw out fire; for, as elephants are terrified at fire, this artifice is employed to put them to flight. — *Voyage d'Orient, par le P. Philippe*, p. 307.

and other parts of Malabar*, horses are not used, and all the warriors who fight not on foot are mounted on elephants. The practice is nearly the same in Tonquin†, Siam‡, and Pegu, where the king and great lords always ride upon elephants. At festivals, they are preceded and followed by a numerous train of these animals, pompously adorned with pieces of shining metal, and covered with rich stuffs. Their tusks are ornamented with rings of gold and silver§; their ears and cheeks are painted; they

* In Cochin, as well as in other parts of Malabar, no horses are used in war. Those who fight not on foot, are mounted on elephants, of which there are great numbers in the mountains; and these mountain elephants are the largest in India.—*Relation d'un Voyage, par Thevenot*, tom. iii. p. 261.

† In the kingdom of Tonquin, the women of rank generally ride upon elephants, so very tall and massy, that they can carry, without any danger, a tower with six men in it, beside the conductor on their neck.—*Il Genio Vagante del Conte Aurelio degli Anzi*, tom. i. p. 282.

‡ See *Le Journal du Voyage de l'Abbé de Choisy*, p. 242.

§ We have seen elephants whose teeth were extremely large and beautiful. In some, they are more than four feet long, and garnished with rings of gold, silver, and copper.—*Premier Voyage du P. Tachard*, p. 273. The grandeur of the princes consists in the number of elephants they are able to keep, which is the chief source of their expense. The Great Mogul has several thousands of them. The king of Madura, the lords of Narzinga and of Bisnager, and the kings of Naires and of Mansul, have several hundreds, which they distinguish into three classes. The largest are destined for the service of the prince. Their harness is extremely rich. They are covered with cloth embroidered with gold, and

are crowned with garlands; and a number of little bells are fixed to different parts of their body. They seem to delight in rich attire; for they are cheerful and caressing in proportion to the number of their ornaments. But it is only in the southern parts of India where the elephants have acquired this degree of polish*. In Africa, it is with difficulty that they can be tamed†. The Asiatics, who have been very anciently civilized, made the education of the elephant a kind of art, and have instructed and modified him according to their own manners. But, of all the African nations, the Carthaginians alone formerly trained the elephants to war; because, at the splendid period of their republic, they were perhaps the most civilized people of the East. There are now no wild elephants in all that part of Africa on this side of Mount Atlas. There are even few beyond these mountains, till we arrive at the river Senegal. But they are numerous in Senegal‡, in Gui-

studded with pearls. Their teeth are adorned with fine gold and silver, and sometimes with diamonds. Those of a middle size are employed in war; and the least are used for common labour.—*Voyage du P. Vincent Marie de St. Catherine de Sienne*, chap. xi.

* In the northern part of India they have a small kind of elephant, from five to six feet in height, which is much used about the court. W.

† The inhabitants of Congo have not the art of taming elephants, which are very mischievous, take crocodiles with their trunks, and throw them to a great distance.—*Il Genio Vag. del Conte Aurelio*, tom. ii. p. 473.

‡ The elephants, of which I daily saw great numbers along

nea *, in Congo †, on the Teeth Coast ‡, in the countries of Anta §, Acra, Benin, and all the

the banks of the river Senegal, no longer astonish me. On the 5th day of November, I walked into the woods opposite to the village of Dagana, where I found a number of their fresh tracks, which I followed near two leagues, and at last discovered five of these animals; three of them lay wallowing, like hogs, in their own soil, and the fourth was standing with its cub, eating the branches of an acacia tree, which they had broken off. By comparing the animal with the height of the tree, I perceived that its crupper was at least eleven or twelve feet high, and its tusks near three feet long. Though my presence did not disturb them, I thought it proper to retire. In pursuing my route, I met with the impressions of their feet, which measured near a foot and a half in diameter. Their dung, which resembled that of a horse, formed balls seven or eight inches in diameter. — *Voyage au Senegal, par M. Adanson*, p. 75. See also *Voyage de la Maire*, p. 97.

* *Voyage de Guinée, par Bosman*, p. 243.

† In the province of Pamba, which belongs to the kingdom of Congo, there are many elephants, on account of the number of rivers and forests with which that country abounds. — *Drake's Voyages*. See likewise, in the Dutch Collection of East India Voyages, *Le Voyage de Vander Broeck*, tom. ii, p. 319; and *Il Genio Vagante del Conte Aurelio*, tom. ii, p. 473.

‡ The first country where elephants are frequent is that part of the coast called by the Flemish *Tand-kust* or *Teeth Coast*, on account of the number of elephants' teeth, of which the natives make a lucrative traffic. Towards the Gold Coast, and in the countries of Awiné, Jaumoré, Eguira, Abocroé, Ancober, and Axim, many elephants are daily slain; and, the more any country is desert and uninhabited, it is proportionally more frequented by elephants and other savage animals. — *Voyage de Guinée, par Guil. Bosman*, p. 244.

§ The country of Anta likewise abounds in elephants; for many of them are not only killed on the main land, but they daily come down to the sea-coast, and under our forts, from which our people descry them, and make great ravages upon

other southern territories of Africa*, as far as those which are terminated by the Cape of Good Hope; except some well inhabited provinces, such as Fida†, Ardra, &c. We even find them in Abyssinia‡, in Æthiopia§, in Nigri-

them. From Anta to Acra, very few are found, but in the places mentioned above, because the countries between Anta and Acra have been a long time tolerably peopled, except that of Fetu, which, for five or six years, has been almost deserted, and the elephants, for that reason, have taken it into their possession. On the coast of Acra, vast numbers are annually slain; because in these districts there is much desert and uninhabited land. . . . In the country of Benin, as well as on the Rio de Calhari, Camerones, and other adjacent rivers and countries, these animals are so numerous, that it is difficult to conceive how the natives can or dare live in them. — *Voyage de Guinée, par Guil. Bosman*, p. 246.

* Below the Bay of St. Helen's, the country is divided into two portions by the Elephant river, which has received its name from the elephants, who love running waters, and are found in great numbers upon their banks. — *Descript. du Cap de Bonne Esperance, par Kolbe*, tom. i. p. 114; tom. iii. p. 12.

† There are no elephants in Ardra, nor in Fida, though, in my time, one was killed there. But the Negroes affirm, that such an event had not happened for sixty years before. I, therefore, imagine that this animal had wandered thither from some other country — *Voyage de Guinée, par Bosman*, p. 245.

‡ See *Voyage Historique d'Abyssinie du P. Lobo*, tom. i. p. 57, where troops of elephants are said to be found in Abyssinia.

§ The Æthiopians have elephants in their country; but they are smaller than those of India; and, though their teeth are hollow, and of less value, they constitute a considerable article of trade. — *Voyage de Paul Lucas*, tom. iii. p. 186. There are many elephants in Æthiopia, and in the country of Prester John, beyond the island of Mosambique, where the Caffres or Negroes kill a great number for the sake of their teeth. — *Recueil des Voyages de la Compagnie des Indes de*

tia *, upon the eastern coasts, and in all the interior parts of Africa. They likewise exist in the large islands of India and Africa, as Madagascar†, Java‡, and as far as the Philippine islands§.

After comparing the testimonies of travellers and historians, it appears that elephants are more numerous and common in Africa than in Asia. They are also less suspicious, and retire not to such distant solitudes. They seem to know the unskillfulness and debility of the men who inhabit this part of the world; for they daily approach the villages, without discovering any ap-

Hollande, tom. i. p. 413. See also *L'Afrique de Marmol*, tom. i. p. 58.

* Elephas Magna copia in silvis Nigritarum regionis invenitur. Solent magno numero confertim incedere, &c. — *Leonis Afric. Descript. Africa*, tom. ii. p. 774 et 745.

† In the island of Madagascar, elephants are supposed to be more numerous than in any other country. Madagascar and an adjacent island, called *Cuzibet*, furnish such vast quantities of ivory, that, in the opinion of the merchants, the rest of the world does not produce an equal number of elephants' teeth. — *Descript. de l'Inde Orient. par Marc Paul*, p. 114.

‡ The animals found in the island of Java, are, 1. elephants, which are tamed and hired out for labour. — *Recueil des Voyages de la Compagnie des Indes de Hollande*, tom. i. p. 411. At Tuban, the king's elephants are each placed under a particular shade supported by four pillars; and, in the middle of the area, which is likewise covered, there is a large stake, to which the elephant is fixed by a chain. — *Idem*. tom. i. p. 526.

§ Mandanar is the only Philippine island which produces elephants; and, as the natives do not tame these animals, as in Siam and Cambaya, they are prodigiously numerous. — *Voyage autour du Monde, par Gemelli Careri*, tom. v. p. 209.

prehensions *. They treat the Negroes with that natural and supercilious indifference which they entertain for all animals. They regard not man as a powerful or formidable being, but as a crafty creature, who knows only how to lay snares in their way, but who dares not attack them face to face, and is ignorant of the art of reducing them to slavery. It is by this art alone, which has been long known in the eastern nations, that the number of these animals has been diminished. The wild elephants, which these people render domestic, become by captivity so many voluntary eunuchs, in whom the sources of generation are daily dried up. But, in Africa, where the elephants are all free, the species is supported, and might even increase, though more of them were destroyed; because every individual is constantly labouring to repair the waste. I perceive no other cause to which this difference of number can be ascribed; for it appears, from every consideration, that the south of India and the East of Africa, are the countries most congenial to the nature of the elephant. He is there much larger and stronger than in Guinea, or any other western region of Africa. He dreads excessive heat, and never inhabits the burning sands of the desert. Neither is the species so numerous in the country of

* The elephants often pass the night in the villages, and are so little afraid of frequented places, that, instead of turning when they perceive the houses of the Negroes, they march straight forward, and overturn them like nut-shells. — *Voyage de la Maire*, p. 98.

the Negroes, as along the rivers; and they are never found in the mountainous parts of Africa. But, in India, the strongest and most courageous of the species, and which have the largest tusks, are called *mountain elephants*: they inhabit the elevated parts of the country, where, the air being more temperate, the waters less impure, and the food more wholesome, they acquire all the perfections of which their nature is capable.

In general, the elephants of Asia exceed, in size, strength, &c., those of Africa; and those of Ceylon, in particular, are superior to all those of Asia, not only in magnitude, but in courage and intelligence. These qualities they perhaps derive from a more perfect education. However this may be, all travellers have celebrated the elephants of this island *, where the surface of the earth is variegated with mountains, which are more elevated in proportion as they advance toward the centre of the island, and where the heat, though great, is not so excessive as in Senegal, Guinea, and the other western parts of

* The elephants of Ceylon are preferred to all others, because they have most courage. . . . The Indians say, that all the other elephants respect those of Ceylon.—*Relation d'un Voyage par Thevenot*, p. 261. The elephants of Ceylon are the boldest of the species.—*Voyage de Bernier*, tom. ii. p. 65. The best and most intelligent elephants come from the island of Ceylon.—*Recueil des Voyages*, tom. i. p. 413; tom. ii. p. 256; tom. iv. p. 363. In Ceylon the elephants are numerous, and more generous and noble than any others. . . . All other elephants revere those of Ceylon, &c.—*Voyage d'Orient. du P. Philippe*, p. 130 et 367.

Africa. The ancients, who knew nothing of this quarter of the world, except the territories situated between Mount Atlas and the Mediterranean, had remarked, that the Lybian elephants were much smaller than those of India *. There are now no elephants in that part of Africa: which proves what was alleged under the article *Lion* †, that men are at present more numerous there than they were in the days of the Carthaginians. The elephants have retired in proportion to the disturbance they have met with from the human species. But, in travelling through the climates of Africa, they have not changed their nature; for the elephants of Senegal, Guinea, &c., are still much smaller than those of India.

The strength of these animals is proportioned to their magnitude. The Indian elephants carry with ease three or four thousand weight ‡: the smaller, or those of Africa, can easily raise with their trunk a weight of two hundred pounds, and place it on their own shoulders §. They draw up into their trunks large quantities of water,

* Indicum (elephantum) Afri pavent, nec contueri audent; nam et major Indicis magnitudo est. — *Plin. Hist. Nat. lib. viii. cap. 9.*

† See art. *Lion*, vol. vi. p. 185.

‡ Relation d'un Voyage par Thevenot, p. 261.

§ The elephant raises with his trunk a weight of two hundred pounds, and places it on his own shoulders. . . . He draws up into his trunk one hundred and fifty pounds of water, which he squirts to a considerable height in the air. — *L'Afrique de Marmol*, tom. i. p. 58.

which they squirt into the air, or all around, to the distance of several fathoms. They can carry a weight of above a thousand pounds on their tusks. They use their trunks for breaking branches, and their tusks for tearing up trees. The greatness of their strength may be still farther conceived from the quickness of their movements, compared with the magnitude of their bodies. At their ordinary step, they make as much way as a horse at a gentle trot; and they run as fast as a horse can gallop: but, in a state of liberty, they never run, unless when enraged or terrified. Domestic elephants are generally walked, and they perform easily, and without fatigue, a journey of fifteen or twenty leagues in a day; and, when pushed, they can travel thirty or forty leagues a day*. Their tread is heard at a great distance, and they may be easily followed by the tracks of their feet, which, in soft ground, measure fifteen or eighteen inches in diameter.

A domestic elephant performs more work than perhaps six horses†; but he requires from his

* When an elephant is pushed, he can perform, in one day, as much as a man generally does in six. — *L'Afrique de Marmol*, tom. i. p. 58.

† The price of elephants is very high. They are sometimes sold from a thousand pagodas of gold to fifteen thousand rupees; that is, from nine or ten thousand livres to thirty thousand. — *Notes de M. de Bussy*. At Ceylon, an elephant is worth, at least, eight thousand *pardaons*; and, when very large, he brings twelve, and even fifteen thousand *pardaons*. — *Hist. de l'Isle de Ceylon, par Ribeyro*, p. 144.

master much care, and a great deal of good victuals, which cost about four francs, or a hundred pence a day *. He is generally fed with rice, raw or boiled, and mixed with water. To keep him in full vigour, he is said to require daily a hundred pounds of rice, besides fresh herbage to cool him; for he is subject to be over-heated, and must be led to the water twice or thrice a day for the benefit of bathing. He easily learns to bathe himself. He takes the water up in his trunk, carries it to his mouth, drinks part of it, and, by elevating his trunk, allows the remainder to run over every part of his body. To give an idea of the labour he performs, it is sufficient to remark, that all the tuns, sacks, and bales, transported from one place to another in India, are carried by elephants; that they carry burdens on their bodies, their necks, their tusks, and even in their mouths, by giving them the end of a rope, which they hold fast with their teeth; that, uniting sagacity to strength, they never break or injure any thing committed to

* The food of an elephant costs about half a pistole each day. — *Relation d'un Voyage par Thevenot*, p. 261. Tamed elephants are very delicate in their feeding. They require rice well boiled, and seasoned with butter and sugar, which is given to them in large balls. They devour daily a hundred pounds of rice, besides leaves of trees, particularly those of the Indian fig, called *bananus* or *plantane*, which are given them by way of refreshment. — *Voyage de Pyrard*, tom. ii. p. 367. See also, *Voyages de la Boullaye-le-Gouz*, p. 250; and *Recueil des Voyages de la Compagnie des Indes de Hollande*, tom i. p. 473.

their charge; that from the margins of the waters, they put these bundles into boats without wetting them, laying them down gently, and arranging them where they ought to be placed; that, when disposed in the places where their masters direct, they try with their trunk whether the goods are properly stowed; and, if a tun or cask rolls, they go, of their own accord, in quest of stones to prop and render it firm.

When the elephant is properly managed, though in captivity, he lives a long time; and, it is probable, that, in a state of liberty, his life is still longer. Some authors affirm, that he lives four or five hundred years*, others two or three hundred †, and others a hundred and twenty, a hundred and thirty, and a hundred and forty ‡. I believe that a medium between

* Onesimus, according to Strabo, lib. xv. says, that elephants live five hundred years. — Philostratus, *Vit. Apoll.* lib. xvi. relates, that the elephant Ajax, which fought for Porus against Alexander the Great, lived four hundred years after that battle. — Juba, king of Mauritania, asserts, that an elephant was taken in Mount Atlas, which was known to have been in a battle four hundred years before:

† Elephantum alii annos ducentos vivere aiunt, alii trecentos. — *Arist. Hist. Anim.* lib. viii. cap. 9. Elephas ut longissimum annos circiter ducentos vivit. — *Arrian. in Indicis.* I saw a white elephant, which was destined to be the successor of that in the palace, and was said to be near three hundred years old. — *Premier Voyage de Siam du P. Tachard*, p. 273.

‡ The elephants grow during one half of their existence, and generally live a hundred and fifty years. — *Drake's Voyage*, p. 104. — The female elephants go two years with

the two extremes is the truth ; and that, if captive elephants live a hundred and twenty, or a hundred and thirty years, those which are free, and enjoy all the conveniences and rights of Nature, ought to exist at least two hundred. Besides if they go two years with young, and require thirty before they obtain their full growth, we may, with still more certainty, conclude, that their life extends beyond the period we have affixed. But captivity abridges their existence less than the injuries arising from change of climate. Whatever care is bestowed on him, the elephant lives not long in temperate, and still shorter in cold countries. That which the king of Portugal sent to Louis XIV. in 1668 *, and which was then only four years old, died in the month of January, 1681, at the age of seventeen, and lived at Versailles only thirteen years, though he was fed plentifully, and managed with the greatest attention. He had daily eighty pounds of bread, twelve pints of wine, and two pails of pottage, mixed with four

young, and live a hundred and fifty years. — *Recueil des Voyages de la Compagnie des Indes de Hollande*, tom. vii. p. 31.

— Notwithstanding all the inquiries I have made, I could never learn exactly how long the elephant lives. The keepers of these animals can give no other information, than that such an elephant was in the possession of their father, grandfather, and great-grandfather; and, by computing the length of time which these people lived, it is sometimes found to amount to a hundred and twenty, or a hundred and thirty years. — *Voyage de Tavernier*, tom. iii. p. 212.

* Mém. pour servir à l'Histoire des Animaux, part iii. p. 101 et 127.

or five pounds of bread; and every second day, in place of pottage, he had two pails of boiled rice, without reckoning what was given him by visitors. He had, besides, a sheaf of corn every day for his amusement; for, after eating the ears, he made a kind of whip of the straw, with which he drove away the flies. He delighted in breaking the straw into small morsels, which he did very dexterously with his trunk; and, as he was daily led out to walk, he pulled and eat the grass. The elephant which was lately at Naples, though the heat is greater there than in France, lived but a few years. Those which were sent to Petersburg, though well sheltered, clothed, and warmed with stoves, all died successively. Hence we may conclude, that this animal is incapable of subsisting, and far less can he multiply, in any part of Europe. But I am astonished that the Portuguese, who first knew the value and utility of elephants in the East Indies, did not transport them to the warm climate of Brasil, where, by leaving them at liberty, they would probably have multiplied. The elephants are generally ash-coloured, or blackish. White elephants, as formerly remarked, are extremely rare*; and authors are quoted who have seen

* Some persons who lived long in Pondicherry, seem to doubt the existence of white and red elephants; for they affirm, that in this part of India, at least, the elephants are all black. It is true, they remark, that, when these animals are long neglected to be washed, the dust which adheres to their oily and naked skin gives them the appearance of a dirty gray colour; but when washed with water, they become as

white and red elephants in different parts of India, where they are highly valued *. Besides, these varieties are so uncommon, that, instead of considering them as distinct races, they ought to be regarded as qualities purely individual and accidental; for, if it were otherwise, we should know the countries of white, red, and black elephants, in the same manner as we know the climates of white, red, and black men. “ In

black as formerly. I believe that black is the natural colour of elephants, and none of any other colour are to be found in those parts of India which these people have had an opportunity of seeing. But, at the same time, it seems not to admit of a doubt, that in Ceylon, Siam, Pegu, Cambaya, &c., some white and red elephants are accidentally to be met with. For ocular witnesses of this fact, we might quote le Chevalier Chaumont, l'Abbé de Choisy, le P. Tachard, Vander Hagen, Joost Schuten, Thevenot, Ogilvy, and other travellers of less note. Hortenfels, who has collected, in his *Elephantographia*, a great number of facts from different voyages, assures us, that the white elephant has not only a white skin, but that the hair of its tail is also white. To these testimonies, we might add the authority of the ancients. Ælian, lib. iii. cap. 46, mentions a small white elephant in India, and seems to insinuate that the mother was black. This variety in the colour of elephants, though rare, is certain, and very ancient. It has, perhaps, proceeded from their domestic condition, to which the Indians have been long accustomed to reduce these animals.

* In the procession of the king of Pegu, two red elephants are led before, harnessed with silk and gold stuffs, which are followed by four white elephants, harnessed in a similar manner, with the addition of precious stones, and the tusks covered with rubies. — *Voyage de la Compagnie des Indes de Hollande*, tom. iii. p. 60.

India," says P. Vincent Marie, "there are three kinds of elephants: the white, which are the largest, the most gentle, and peaceable, are adored as gods by several nations: the red, such as those of Ceylon, though the smallest in size, are the most valorous, the strongest, and the best for the purposes of war; the other elephants, whether from natural inclination, or from recognising something superior, pay great respect to those of Ceylon: the black is the third kind, and they are the most common, and in most estimation *." This is the only author who seems to hint, that Ceylon is the peculiar climate of red elephants; for other travellers make no mention of such a fact. He likewise asserts, that the Ceylon elephants are the smallest. Thevenot says the same thing in his *Voyage*, p. 260. But other writers relate the reverse. In fine, P. Vincent is the only author who says, that the white elephants are the largest. P. Tachard, on the contrary, assures us, that the king of Siam's white elephant was diminutive, though very old. After comparing the testimonies of travellers with regard to the magnitude of elephants in different climates, it appears, that the smallest are those of the west and north of Africa, and that the ancients, who knew only the northern part of Africa, were right in their general assertion, that the Indian elephants were much larger than those of Africa. But, in

* *Voyage du P. Fr. Vincent Marie de St. Catherine de Sienne*, chap. 9, translated from the Italian by M. le marquis de Montmirail.

the eastern regions of this quarter of the world, of which the ancients were ignorant, the elephants are as large, and perhaps larger, than those of India. In this last region, it appears, that the elephants of Siam, Pegu, &c., are larger than those of Ceylon; which, however, from the unanimous testimony of travellers, have more courage and intelligence.

Having thus marked the principal facts with regard to the species, let us next examine, in detail, the properties of the individual, his senses, movements, size, strength, address, sagacity, &c. In proportion to the magnitude of his body, the eyes of the elephant are very small; but they are lively and brilliant: what distinguishes them from the eyes of all other animals, is a pathetic expression of sentiment, and an almost rational management of all their actions*. He turns them slowly and with mildness towards his master. When he speaks, the animal regards him with an eye of friendship and attention, and his penetrating aspect is conspicuous when he wants to anticipate the inclination of his governor. He seems to reflect, to deliberate, to think, and never determines till he has several times examined, without passion or precipitation, the signs which he ought to obey. The dog, whose eyes are very expressive, is too prompt and vivacious to allow us to distinguish with ease the successive shades of his sensations. But as the elephant is naturally grave and moderate, we read in his

* *Elephantographia Christophori Petri ab Hartenfels.**

eyes, whose movements are slow, the order and succession of his internal affections*.

His ear is very good; and the external organ of hearing, like that of smelling, is more remarkable in the elephant than in any other animal. His ears are very large, and much longer, even in proportion to his body, than those of the ass. They lie flat on the head, like the human ears. They are commonly pendulous; but he can raise and move them with such facility, that he uses them to defend his eyes from dust and flies†. He delights in the sound of musical instruments, and moves in cadence to the trumpet and tabor. His sense of smelling is exquisite, and he is passionately fond of perfumes of every kind, and especially of odoriferous flowers, which he gathers one by one, makes nosegays of them, and, after gratifying his nose, conveys them to his mouth. The flowers of the orange constitute one of his most delicious morsels. With his trunk he robs an orange tree of all its verdure, eating the fruit, the flowers, the leaves, and even the small branches‡. In the

* The eyes of the elephant are, proportionally, exceedingly small; but they are very active and lively, and they uniformly move in such a manner, as gives him the air of thought and reflection.—*Voyage au Indes Orientales du P. Fr. Vincent Marie de St. Catherine de Sienne*, p. 376.

† The elephant has very large ears. . . . He perpetually moves them with much gravity, and they defend his eyes from all kinds of insects.—*Id. ibid.* See also *Les Memoires pour servir à l'Histoire des Animaux*, part iii. p. 107.

‡ *Voyage de Guinée, par Bosman*, p. 243.

meadows, he selects the most odoriferous plants; and, in the woods, he prefers the cocoa, the banana, the palm, and the sage trees; and, as these trees are soft and tender, he eats not only the leaves and fruit, but even the branches, the trunk, and the roots; for, when they are unable to pull up the trees with their trunk, they always succeed by using their tusks.

With regard to the sense of touching, it is chiefly confined to the trunk; but, in this member, it is as delicate and distinct as in the human hand. The trunk is composed of membranes, nerves, and muscles; it is both an organ of feeling and of motion. The animal can not only move and bend, but he can contract, lengthen, and turn it on all sides. The extremity of the trunk terminates in a protuberance *, which stretches out on the upper side in the form of a finger, by means of which the elephant performs all that we do with our fingers. He lifts from the ground the smallest piece of money; he selects the herbs and flowers, and picks them up one by one; he unties the knots of ropes, opens and shuts gates, by turning the keys, or pushing back the bolts. He learns to trace regular characters with an instrument as small as a quill †.

* Mem. pour servir à l'Histoire des Animaux, part iii. p. 108, 140.

† Mutianus ter Consul auctor est, aliquem ex his et litterarum ductus Græcarum didicisse, solitumque præscribere ejus linguæ verbis: ipse ego hæc scripsi, &c. — *Plin. Hist. Nat.* lib. viii. cap. 3. Ego vero ipse elephantum in tabula litteras Latinas promuscide atque ordine scribentem vidi:

It cannot be denied that the elephant's hand has several advantages over ours. It is equally flexible, and as dexterous in touching or laying hold of objects. These operations are performed by means of the appendix or finger, situated on the superior part of the border, that surrounds the extremity of the trunk, in the middle of which there is a concavity in the form of a cup, and in the bottom of the cup are the apertures of the two common canals of smelling and of respiration. The elephant, therefore, has his nose in his hand, and is enabled to combine the power of his lungs with the action of his fingers, and to attract fluids by a strong suction, or to raise heavy bodies by applying to them the edge of his trunk, and making a vacuum within by a vigorous inspiration.

Hence delicacy of feeling, acuteness of smelling, facility of movement, and the power of suction, are united at the extremity of the elephant's nose. Of all the instruments which Nature has so liberally bestowed on her most favourite productions, the trunk of the elephant is perhaps the most complete and the most admirable. It is not only an organic instrument, but a triple sense, whose united functions are at once the cause, and produce the effects of that sagacity and those remarkable talents which distinguish the elephant,

verumtamen docentis manus subjieebatur ad litterarum ductum et figuram eum instituens; dejectis autem et intentis oculis erat cum scriberet; doctos et litterarum gnaros animalium oculos esse dixisses. — *Ælian. de Nat. Anim.* lib. ii. cap. 11.

and exalt him above all other quadrupeds. He is not so subject, as other animals, to errors of vision; because he quickly rectifies them by the sense of touching; and, by using his trunk, as a long arm, for the purpose of touching remote objects, he acquires, like man, clear ideas of distances. But the other animals, except the monkeys and some others who have a kind of arms and hands, cannot acquire ideas of distance but by traversing space with their bodies. Of all the senses, that of touching has the greatest relation to intelligence. The delicacy of touching, the flexibility of the trunk, the power of suction, the sense of smelling, and the length of the arm, give the ideas of the substance of bodies, of their external form, of their weight, of their salutary or noxious qualities, and of their distance. Thus, by the same members, and by one simultaneous act, the elephant feels, perceives, and judges of several things at one time. Now, a multiplied sensation is equivalent, in some measure, to reflection: though this animal, therefore, is, like all others, deprived of the faculty of reflecting, as his sensations are combined in the same organ, contemporary, and not separated from each other, it is not surprising that he should have ideas of his own, and readily acquire those we wish to communicate to him. The memory of the elephant should be more perfect than that of any other animal; for memory depends greatly on the circumstances of actions. No solitary sensation, however lively, can leave any distinct or durable impression; but several combined and

contemporary sensations make deep and lasting impressions; so that, if the elephant cannot recollect an idea by touch alone, the adjacent and accessory sensations of smelling, and the power of suction, which have acted at the same time, aid him in recalling the remembrance of it. In man, the best mode of rendering the memory faithful, is to employ successively all our senses in examining an object; and it is owing to the neglect of habituating ourselves to the combined use of our senses, that we forget most things we ought to remember.

But, though the elephant has more memory and intelligence than any other animal, his brain is proportionally smaller than that of most quadrupeds*. I mention this fact as a proof that the brain is not the seat of sensation, the *sensorium commune*, which, on the contrary, resides in the nerves of the senses, and in the membranes of the head. Thus the nerves distributed upon the trunk of the elephant, are so numerous as to be equivalent to all those bestowed on the rest of the body. It is, therefore, by virtue of this singular combination of senses and faculties in the trunk, that the elephant excels all other animals in sagacity, notwithstanding the enormity of his mass, and the disproportion of his form; for the elephant is, at the same time, a miracle of intelligence and a monster of matter. The thickness and inflexibility of his body; the shortness

* Mem. pour servir à l'Histoire des Animaux, part iii. p. 135.

and stiffness of his neck; the smallness and deformity of his head; the excessive largeness of his ears and nose; the minuteness of his eyes, mouth, genitals, and tail; his straight, clumsy, and almost inflexible limbs; the shortness and smallness of his feet*, which are hardly apparent; the thickness and callosity of his skin: all these deformities are the more conspicuous and disagreeable to the eye, because they are modelled on a large scale, and most of them peculiar to the elephant alone; for in no animal are the head, the feet, the nose, the ears, and the tusks, situated like those of the elephant.

From this strange conformation, the animal is subjected to several inconveniences. He moves his head with difficulty, and cannot turn himself, in order to go back, without making a circuit. The hunters who attack him behind, or on the flanks, avoid the effects of his vengeance by circular movements; and they have time to renew their blows while he is turning himself against them. His legs, the rigidity of which is not so great as that of his neck and body, bend but slowly and with difficulty. They are strongly articulated to the thighs. His knee is like that

* The feet of every animal except the elephant are proportionally larger than those of man. — The feet were so small as to be hardly perceptible; because the toes are covered with the skin of the legs, which hangs down on all sides as far as the ground; and appears like the trunk of a tree cut across. — *Mém. pour servir d'Hist. des Animaux*, p. 102.

of man*, and his foot is equally low; but the latter has no extent, spring, or force, and the former is hard and rigid. As long, however, as the elephant is young and in health, he bends his knees to lie down, and allows himself to be mounted, or charged with a load. But, when old or sick, this movement becomes so laborious, that he chooses rather to sleep on his feet; and, if forced to lie down†, machines are necessary to raise him. His tusks, with age, become enormously heavy, and not being placed, like the horns of other animals, in a vertical position, form two long levers, which, by their almost horizontal direction, fatigue the head prodigiously, and make it hang down; so that the animal is sometimes obliged to make holes in the wall of his lodge to support them, and relieve him of their weight‡. He has the disadvantage

* His knee is situated like that of man, in the middle between the belly and the foot; so that the elephant's leg is similar to a man's both with regard to the position of the knee and the smallness of the foot, the extent of which, from the heel to the toes, is very small.—*Mem. pour servir à l'Hist. des Animaux*, part iii. p. 102.

† We learned from the people who had the charge of the elephant at Versailles, formerly mentioned, that, the first eight years he lived, he lay down and rose with great facility; and that, during the last five years, he did not lie down to sleep, but leaned against the wall of his apartment; so that, if he had happened to lie down when sick, it would have been necessary to pierce the floor above, in order to raise him with engines.—*Mem. pour servir à l'Hist. des Animaux*, p. 104.

‡ We saw where the elephant had employed his tusks in making holes in a stone pillar, which projected from the wall

of having the organ of smelling very distant from that of tasting, and the inconvenience of not being able to seize any thing on the ground with his mouth, because his neck is too stiff and too short to allow his head to reach the earth. He is, therefore, obliged to lay hold of his food, and even of his drink, with his nose, and then to convey it, not only to the entrance of his mouth, but as far as the throat; and, when the trunk is filled with water, he thrusts the end of it to the very root of the tongue*, seemingly with the intention of pushing back the epiglottis to prevent the water which rushes out with impetuosity, from entering into the larynx; for he forces out the water by the same air which he employed to suck it up, and it rushes out of the trunk with noise, and precipitantly enters the gullet. The tongue, the mouth, and the lips, are of no use to him, as in other animals, to suck or lap his drink.

From this description, the singular consequence results, that the young elephant must suck with its nose, and afterwards convey the milk to its gullet. We are told, however, by the ancients, that he sucks with his mouth, and not with his trunk†. But there is reason to believe that they

of his lodge, and these holes supported him when sleeping, his tusks being put into them. — *Ibid.* p. 102.

* *Mém. pour servir à l'Hist. des Animaux*, part iii. p. 109.

† *Pullus editus ore sugit, non promuscide, et statim cum natus est cernit et ambulat.* — *Arist. Hist. Anim.* lib. vi. cap. 27. *Anniculo quidem vitulo æqualem pullum edit elephantus, qui statim, ut natus est, ore sugit.* — *Ælian. de Nat. Anim.* lib. vi. cap. 3.

never were witnesses of the fact, and that they reasoned solely from the analogy of other animals. If the young elephant ever acquired the habit of sucking with his mouth, why should he lose it during the rest of his life? Why does he never employ the mouth to suck in water? Why does he uniformly employ a double action, when a single one would answer the purpose? Why does he never seize any object with his mouth, except what is thrown into it when open? * It is, therefore, extremely probable, that the young elephant sucks with his trunk only. This presumption is not only proved by the following facts, but is founded on a stronger analogy than that which gave rise to the opinion of the ancients. We formerly remarked, that, in general, animals, at the moment of birth, can perceive the presence of the aliment they want by no other sense but that of smelling. The ear can have no effect; neither can the eye; for most animals are blind when they begin to suck. The sense of touching can only convey a vague and indiscriminate notion of all the parts of the mother's body, or, rather, it can indicate nothing relative to appetite. But the sense of smelling is alone sufficient for this purpose: it is not only a species of taste, but a foretaste, which precedes, accompanies, and determines the other kind. The elephant, therefore, like all other animals, perceives, by this foretaste, the presence

* Voyez les Memoires pour servir à l'Hist. des Animaux, part iii. p. 109 et 110.

of his aliment; and, as the seat of smelling is united with the power of suction, at the extremity of the trunk, he applies it to the teat, sucks the milk, and conveys it to the mouth to satisfy his appetite. Besides, the two paps, as in woman, are situated on the breasts, and the teats being very small in proportion to the size of the young one's mouth, whose neck also has little flexibility, the mother must have lain on her back or side to enable her young to lay hold of the teat with its mouth; and, even in this situation, it would have been difficult to extract the milk, on account of the enormous disproportion between the largeness of the mouth and the smallness of the teat. But the margin of the trunk, which the animal contracts at pleasure, is easily accommodated to the teat, and enables the young elephant to suck the mother either when she stands or lies on her side. Thus every circumstance concurs in invalidating the notion of the ancients on this subject; for none of them, nor even any of the moderns, allege that they ever saw the elephant sucking; and I have no hesitation in predicting, that, whenever such an observation is made, it will appear, that he sucks not with his mouth, but with his nose*. I likewise imagine

* In this particular, Buffon is certainly mistaken. Mr. Corse, whose veracity is unquestioned, tells us that young elephants suck constantly with their mouths; never with their trunks. "I have seen young ones," says that gentleman, "from one day to three years old, sucking their dams, but never saw them use their trunks, except to press the breast, which by natural instinct they seemed to know would make the milk flow more readily." W.

that the ancients are deceived, when they tell us, that the elephant copulates like other quadrupeds, the female only lowering her crupper*, for the more easy reception of the male. The situation of the part seems to render this mode of junction impossible. The female elephant has not, like other quadrupeds, the orifice of the vagina adjacent to the anus; for it is situated nearly in the middle of the belly, about two and a half, or three feet distant from the anus. On the other hand, the male organ is by no means proportioned to the magnitude of his body, nor to so long an interval, which, in the situation supposed, would preclude the practicability of his approach. Naturalists, as well as travellers, agree in affirming that the male organ of the elephant exceeds not, either in length or diameter†, that of a horse. It is therefore impossible that he should attain his end in the ordinary position of quadrupeds. The female must necessarily lie on her back. De Feynes§ and Tavernier|| posi-

* Subsedit scemina, clauibusque submissis, et insistit pedibus ac innititur; mas superveniens comprimit, atque ita munere venereo fungitur. — *Arist. Hist. Anim.* lib. v. cap. 2.

† Mem. pour servir à l'Hist. des Animaux, part. iii. p. 192.

‡ Elephantus genitale equo simile habet, sed parvum nec pro corporis magnitudine. Testes idem non foris conspicuos sed intus circa renes conditos habet. — *Arist. Hist. Anim.* lib. ii. cap. 1. — *L'Afrique d'Ogilby*, p. 13 et 14.

§ When these animals couple, the female lies on her back; and, after the operation, the male raises the female with his trunk. — *Voyage par Terre à la Chine du S. de Feynes*, p. 90.

|| Though the elephants have no intercourse in a domestic state, yet they frequently come in season. It is remarkable

tively assert, and the situation of the parts confirms their evidence, that these animals cannot intermix in any other manner*. They require, therefore, more time and conveniency for this operation than other quadrupeds; and it is, perhaps, for this reason, that they never copulate but when they enjoy full liberty, and have every necessary article at their command. The female must not only consent, but solicit the male by a position which she never assumes unless when she thinks herself in perfect retirement†. May we not, therefore, conclude, that modesty is a physical virtue which exists in the brute creation? It is, at least, like softness, moderation, and temperance, a general and beautiful attribute of the female sex.

that the female, on these occasions, collects all kinds of herbs and leaves, of which she makes a bed elevated four or five feet above the ground, and, contrary to the nature of all other quadrupeds, lies down on her back, and solicits the male by her cries. — *Voyage de Tavernier*, tom. iii. p. 240.

* This article was written before I saw M. de Bussy's Notes concerning the elephant; and his evidence fully confirms the fact, which the situation of the parts had suggested. "The elephants," says M. de Bussy, "copulate in a singular manner. The female lies down on her back. The male rests on his fore-legs, bends down those behind, and touches not the female any farther than is necessary to effect his purpose."

† Pudore nunquam nisi in abdito coeunt. — *Plin. Hist. Nat.* lib. viii. cap. 3. The elephants couple very rarely; and, when they do, it is with such secrecy, and in places so solitary, that they have never been observed by any person. When in a domestic state, they never produce. — *Voyage aux Indes Orientales du P. Vincent Marie de Sainte Catherine de Sienna*, chap. xi. p. 326.

But this conjecture, which appeared to be plausible, is not true; for the following testimony of M. Marcel Bles, an eye witness, deserves full credit.

“ Having perceived that the count de Buffon, in his excellent work, is deceived with regard to the copulation of elephants, I must observe, that, in several parts of Asia and Africa, these animals, especially during the season of love, remain always in the most inaccessible places of the forests; but, in the island of Ceylon, where I lived twelve years, the land being every where inhabited, they cannot so easily conceal themselves; and, having often examined them, I perceived that the female organ is situated nearly under the middle of the belly, which would lead us to think, with M. de Buffon, that the males cannot cover the females in the manner of other quadrupeds. However, there is only a slight difference of situation. When they inclined to copulate, I perceived that the female bowed down her head and neck, and leaned her two fore-legs, which were also bended, upon the root of a tree, as if she meant to prostrate herself on the ground; and the two hind-legs remained erect, which gave the male an opportunity of embracing her as other quadrupeds do. I can likewise affirm, that the females go with young about nine months. Moreover, the elephants never copulate, unless when in a state of freedom. In the season of love, the males are strongly chained for four or five weeks, during which time, they discharge vast quantities of semen, and are so fu-

rious, that their cornacks or governors cannot come near them without danger. The approach of the rutting season is easily known; for some days before it happens, an oily liquor flows from a small hole on each side of the head. The domestic female, on these occasions, sometimes makes her escape, and joins the wild males in the woods. Some days afterward, her cornack goes in quest of her, and calls her by her name till she comes. She submits to him with complacence, and allows herself to be conducted home, and shut up in the stable. It was from cases of this kind that it was discovered that the females bring forth about the end of nine months."

The first remark with regard to the mode of copulating, seems to be unquestionable, since M. Marcel Bles assures us that he has seen the elephants perform the operation. But, as to the time of gestation, which he limits to nine months, we ought to suspend our judgment, because all travellers affirm, that the female elephant is believed to go with young no less than two years *.

The sound of his voice is likewise extremely singular. If we believe the ancients, the elephant utters two kinds of cries, one by the trunk, which, from its sinuosities and inflexions, is rough and long, like the sound of a trumpet; and another by the mouth, which is interrupted by short pauses and

* We learn from the observations of Mr. Corse that the period of gestation is rather less than two years. W.

harsh sighs *. This fact, which was advanced by Aristotle, and afterwards repeated by naturalists and travellers, is probably false, or, at least, not exactly related. M. de Bussy denies that the elephant utters any cry through the trunk. However, as a man, by shutting his mouth close, can make a sound through his nose, the elephant, whose nose is so large, may produce sounds in the same manner. But, however this may be, the cry of the elephant is heard at the distance of more than a league, and yet it excites not terror like the roaring of the lion or tiger.

The elephant is still more singular in the structure of his feet and the texture of his skin, which last is not, like other quadrupeds, covered with hair, but totally bare, as if it were shaven. There are only a few bristles in the fissures of the skin, and these bristles are thinly scattered over the body, but very numerous on the cilia and back of the head †, in the auditory passages, and the insides of the thighs and legs. In the epidermis, or scarf skin, there are two kinds of wrinkles, the one raised and the other depressed, which give it the appearance of being cut into

* *Elephantus citra nares ore ipso vocem edit spirabundam, quemadmodum cum homo simul et spiritum reldit et loquitur, et per nares simile tubarum rancitati sonat. — Arist. Hist. Anim. lib. iv. cap. 9. Citra nares ore ipso sternutamento similem edit sonum; per nares autem tubarum rancitati. — Plin. Hist. Nat. lib. viii.*

† *Memoires pour servir à l'Histoire des Animaux, part iii. p. 113.*

fissures, resembling pretty nearly the bark of an old oak tree. In man, and other animals, the epidermis adheres throughout to the skin; but, in the elephant, it is only attached by some points of insertion, like two pieces of cloth stitched together. This epidermis is naturally dry, and very subject to grow thick. It often acquires the thickness of three or four lines, by the successive drying of different layers which are produced one above another. It is this thickening of the scarf skin which gives rise to the *elephantiasis* or *dry leprosy*, to which man, whose skin is naked like that of the elephant, is sometimes subject. This disease is very common to the elephant; and the Indians, to prevent it, rub him frequently with oil, and bathe him with water, with a view to preserve the skin clean and flexible. The skin, where it is not callous, is extremely sensible. In the fissures, and other places where it is neither dry nor hardened, the elephant feels the stinging of flies in such a manner, that he not only employs his natural movements, but even the resources of his intelligence, to get rid of them. He strikes them with his tail, his ears, and his trunk. He contracts his skin, and crushes them between its wrinkles. He drives them off with branches of trees, or handfuls of long straw. When all these artifices are unsuccessful, he collects dust with his trunk, and covers all the sensible parts of his skin with it. He has been observed pulverizing himself in this manner several times in a day; and always at the most proper season, namely,

after bathing *. The use of water is as necessary to these animals as air. When free, they never quit the banks of rivers, and often go into the water till it reaches their belly, and in this situation they daily spend several hours. In India, where the elephants are treated in the manner that best corresponds with their nature and temperament, they are carefully bathed, and allowed time and every possible conveniency for bathing themselves †. Their skin is cleaned by

* I was informed that the elephant at Versailles always rolled in the dust after bathing, which he did as often as he was allowed; and it was observed that he threw dust upon all the places which had been missed when he rolled himself, and that he drove off the flies with handfuls of straw, or by throwing dust with his trunk on the places where he felt himself stung; there being nothing which the flies avoid so much as falling dust. — *Mem. pour servir a l'Hist des Animaux*, part iii. p. 117.

† About eight or nine o'clock before noon, we went to the river to see the elephants belonging to the king and the nobles bathed. The animal goes into the water till it reaches his belly, and, lying down on one side, fills his trunk several times, and throws the water upon the parts which are uncovered. The master then rubs off, with a kind of pumice-stone, all the dirt that has been collected on the creature's skin. Some authors tell us, that, when the elephant lies down, he is unable to raise himself. But this assertion is not founded in truth; for the master, after rubbing on one side, desires the animal to turn to the other, which he does very quickly; and after both sides are well curried, he comes out of the river, and stands some time on the bank till he dries. The master then brings a pot of red or yellow paint, and draws lines on the elephant's face, round the eyes, and upon the breast and rump. He is next rubbed over with oil, to strengthen his nerves. — *Voyage de Tavernier*, tom. iii. p. 264.

rubbing it with a pumice stone; and then they are anointed with perfumed oils, and painted with various colours.

The structure of the elephant's feet and legs differs from that of most other animals. The fore-legs appear to be longer than the hind-legs, and yet the former are somewhat shorter*. The hind-legs are not bended in two places like those of the horse and ox, in whom the thigh bone is almost totally concealed in the buttock, the knee is situated near the belly, and the bones of the foot are so high and so long, that they appear to constitute a great part of the leg. But the foot of the elephant is very short, and rests on the ground. His knee, like that of man, is placed near the middle of the leg. The short foot of the elephant is divided into five toes, which are so covered with the skin as not to be visible. We only see a kind of nails, the number of which varies, though that of the toes remains always the same. There are uniformly five toes on each foot, and commonly five nails†; but sometimes there are only four‡, or even

* Mem. pour servir à l'Hist. des Anim. part iii. p. 102.

† The Royal Academy of Sciences recommended to me to examine whether all the elephants had nails on their feet. I never saw a single elephant which had not five on each foot at the extremities of the five large toes. But the toes are so short, that they hardly project from the foot. — *Premier Voyage du P. Tuckard*, p. 273.

‡ All those who have written concerning the elephant, assign five nails to each foot; but, in our Subject, there were only three. The small Indian elephant formerly mentioned

three nails; and, in this case, they correspond not exactly with the extremities of the toes. Besides, this variety, which has only been remarked in young elephants brought to Europe, seems to be purely accidental, and probably depends on the manner the animal has been treated during the first years of its growth. The sole of the foot is covered with a kind of leather as hard as horn, and projects outward all around. The nails consist of the same substance.

The ears of the elephant are very long, moveable at pleasure, and serve the animal as a fan. The tail is not longer than the ears, being generally from two and a half to three feet in length. It is thin, pointed, and garnished at the extremity with a tuft of thick hairs, or rather threads, of a black, glossy, solid, horny substance. This hair or horn is as thick and strong as iron-wire, and a man cannot break it by pulling with his hands, though it be flexible and elastic. In fine, this tuft of hair is greatly esteemed as an ornament by the Negro women, who are probably attached to it by some superstition*. An ele-

had four nails both on the fore and hind-feet. But there are uniformly five toes on each foot. — *Mem. pour servir à l'Hist. des Animaux*, part iii. p. 103.

* Merolla remarks, that many of the Pagans in these countries, and particularly the Saggas, have a devout regard for the elephant's tail. When any of their chiefs die, they preserve, in honour of him, one of these tails, to which they pay a kind of religious worship, founded on the notion of its power. They often go a hunting solely with a view to obtain a tail of this kind. But it must be cut off with a single

phant's tail is sometimes sold for two or three slaves; and the Negroes often hazard their lives in endeavouring to cut it off from the live animal. Beside this tuft, the tail is covered, or rather strewed, through its whole extent, with bristles as large and as hard as those of the wild boar. These bristles are also found on the convex part of the trunk and the eyebrows, where they sometimes exceed a foot in length. Bristles or hairs on the eyelids are peculiar to man, the monkey, and the elephant.

Climate, food, and situation, have a great influence on the growth and size of the elephant. In general, those that are taken young, and reduced to captivity, never acquire their natural dimensions. The largest elephants of India and the eastern parts of Africa are fourteen feet high; the smallest, which are found in Senegal, and other western regions of Africa, exceed not ten or eleven feet; and those which are brought to Europe when young, never arrive at this height. The Versailles elephant, which came from Congo *, at the age of seven years, was not above seven and a half feet high. During the thirteen years that he lived, he acquired only one foot; so that, at the age of four, when he was transported, he was only six and a half feet in height; and, as the rate of growth always diminishes as animals advance in years, it cannot be

blow from the live animal, without which, superstition allows it no virtue. — *Hist. Gen. des Voyages, par l'Abbé Prevost, tom. v. p. 79.*

* Mem. pour servir à l'Hist. des Animaux, part iii. p. 101.

supposed, that, if he had lived thirty years, the common period when the growth of elephants is completed, he would have acquired more than eight feet in height. Hence the domestic state reduces the growth of the elephant one third, not only in height, but in all other dimensions. The length of his body, from the eye to the origin of the tail, is nearly equal to his height at the withers. An Indian elephant, therefore, of fourteen feet high, is more than seven times larger and heavier than the Versailles elephant. By comparing the growth of this animal to that of man, we shall find, that an infant being commonly thirty-one inches high, that is, one half of its height, at the age of two years, and taking its full growth at twenty years, the elephant, which grows till thirty, ought to acquire the half of his height in three years. In the same manner, if we would form a judgment of the enormous mass of the elephant, we shall find, that, the volume of a man's body being supposed to be two cubic feet and a half, the body of an elephant of fourteen feet long, three feet thick, and a proportional breadth, would be fifty times as large; and, consequently, that an elephant ought to weigh as much as fifty men*. "I saw," says le P. Vincent Marie, "some ele-

* Peirère, in his *Life of Cassendi*, says, that an elephant, which he caused to be weighed, was 3,500 pounds. This elephant seems to have been very small; for, according to the calculation I have made in the text, the dimensions of which I rather under-rated, he would have weighed at least 9,000 pounds.

phants which were fourteen and fifteen * feet high, with a proportional length and thickness. The male is always larger than the female. The price of these animals augments in proportion to their size, which is measured from the eye to the extremity of the back; and, after exceeding certain dimensions, the price rises like that of precious stones†.” “The Guinea elephants,” Bosman remarks, “are ten, twelve, or thirteen feet high‡; and yet they are incomparably smaller than those of the East Indies; for the historians of that country give more cubits to the height of the latter than the former has feet§.” “I saw,” said Edward Terry, “elephants of thirteen feet in height, and many people affirmed, that they had seen elephants fifteen feet high||.”

From these, and many other authorities which might be enumerated, we may conclude, that the ordinary stature of the elephant is from ten to eleven feet; that those of thirteen and fourteen are very rare; and that the smallest, when they acquire their full growth in a state of liberty, are at least nine feet¶. These enormous masses of

* These are probably Roman feet.

† Voyage aux Indes Orientales du P. Vincent Marie, chap. xi. p. 396.

‡ These are probably Rhenish feet.

§ Voyage de Guinée de Guillaume Bosman, p. 244.

|| Voyage to the East Indies by Edward Terry. Note. These are perhaps English feet.

¶ The usual height of the male (measured at the shoulder) is from eight to ten feet; of the female, from seven to eight. Elephants above eleven feet high are very rarely met with.

matter fail not, however, as formerly remarked, to move with great quickness. They are supported by four members, which, instead of legs, resemble massy columns of fifteen or eighteen inches diameter, and from five to six feet high. These legs, therefore, are twice as long as those of a man. Hence, though the elephant should make but one step, while a man makes two, it would outstrip him in the chase. The ordinary walk of the elephant is not quicker than that of a horse *; but when pushed, he assumes a kind of amble, which, in fleetness, is equivalent to a gallop. He performs with promptness, and even with freedom, all direct movements; but he wants facility in oblique or retrograde motions. It is generally in narrow and hollow places, where the elephant can hardly turn, that the Negroes attack him, and cut off his tail, which they value above all the rest of the body. He has great difficulty in descending steep declivities, and is obliged to fold his hind-legs †, that, in going down, the anterior part of his body may be on a level with the posterior, and to prevent being precipitated by his own weight. He swims well, though the form of legs and feet seem to indicate the contrary. as the capacity of his breast and belly is large, as the size of his lungs and intestines is enormous, and as all the great parts of his body are filled with air, or matters lighter than water, he sinks

* Notes of M. de Bussy, communicated by the marquis de Montmirail.

† Notes of M. de Bussy.

not so deep as other animals. He has, therefore, less resistance to overcome, and, consequently, is enabled to swim more quickly with smaller efforts of his limbs. Of course, he is of great use in the passage of rivers. When employed on these occasions *, beside two pieces of cannon which admit three or four pound balls, he is loaded with great quantities of baggage, independent of a number of men fixed to his ears and his tail. When thus loaded, he enters the river, and swims so much below the water that no part of his body is seen except his trunk, which he raises in the air for the benefit of respiration.

Though the elephant generally feeds on herbs and tender wood, and though prodigious quantities of this aliment are necessary to afford a sufficient number of organic particles to nourish so vast a body, he has not several stomachs, like most animals who live on the same substances. He has but one stomach, does not ruminate, is formed rather like the horse, than the ox and other ruminating animals. The want of a paunch is supplied by the largeness and length of his intestines, and particularly of the colon, which is two or three feet in diameter, by fifteen or twenty in length. The stomach is much smaller than the colon, being only three and a half or four feet long, and only one, or one and a half in its largest diameter. To fill such capacious vessels, it is necessary that the animal, when not furnished with nourishment more sub-

* Notes of M. de Bussy.

stantial than herbage, should eat almost perpetually. Wild elephants, accordingly, are almost continually employed tearing up trees, gathering leaves, and breaking young wood; and the domestic elephants, though supplied with great quantities of rice, fail not to collect herbs whenever they have an opportunity. However great the appetite of the elephant, he eats with moderation, and his taste for cleanliness is superior to the calls of hunger. His address in separating with his trunk the good leaves from the bad, and the care which he takes in shaking them till they are perfectly clear of insects and sand, afford great pleasure to the spectator*. He is fond of wine, aquavitæ, arrack, &c. By showing him a vessel filled with any of these liquors, and promising him the contents as the reward of his labours, he is induced to exert the greatest efforts, and to perform the most painful tasks. He seems to love the smoke of tobacco; but it stupefies and intoxicates him. He abhors all bad smells; and is so afraid of the hog, that the cry of that animal makes him fly ††.

* Notes of M. de Bussy.

† The Versailles elephant had such a terror and aversion at swine, that the cry of a young hog made him fly to a great distance. This antipathy has been remarked by *Ælian*.

‡ As the count has not made any observations on the dentition of elephants, I shall add some curious particulars on that subject, from the communications of Mr. Corse in the *Philosophical Transactions*.

Mr. Corse observes, that the grinders of elephants are composed of several distinct laminæ or teeth, each covered with its proper enamel, and joined to each other by an inter-

To complete the idea of the nature and intelligence of this singular animal, I shall here add some notes communicated to me by the marquis de Montmirail, president of the Royal Academy of Sciences, who has been so obliging as not only to collect, but to translate every thing regarding quadrupeds, from some Italian and German books with which I am unac-

mediate softer substance, acting as a cement. This cement is worn away by the action of mastication sooner than the enamel; therefore, shortly after the grinders cut the gum, the enamel rises considerably higher than the cement, and gives to each tooth a ribbed appearance, as if it had been originally formed with ridges. The number of these teeth, or portions, in the grinders of an elephant, varies with the animal's age, and consists of from four to twenty-three, all enclosed in one common case; so that a single grinder in a full grown elephant is more than sufficient to fill one side of the mouth. The shape of the grinders of the lower jaw differs from those of the upper. The first, or milk teeth, begin to cut the gum eight or ten days after birth; these teeth are not shed, but gradually wear away while the second set are coming forward. The second set are completely in use when the animal is two years old: about this time the third set begins to appear, and continues gradually to increase in growth till the beginning of the sixth year, the former set being in the mean time worn away and their roots absorbed. The fourth set comes forward from the beginning of the sixth to the end of the ninth year, and is then succeeded by others; but at what time or in what proportion, has not as yet been ascertained.

Besides the observations of Mr. Corse, we have accounts by Pallas; by professor Camper, and his son Adrien; by Home; by Blake; and particularly by Cuvier, who, in a *Memoire sur les Elephans vivans et Fossiles* (published in the *Annales du Museum d'Histoire Naturelle*, tom. viii.), has treated the subject of dentition at considerable length. W.

quainted. His zeal for the advancement of knowledge, his exquisite discernment, and his extensive knowledge in natural history, entitle him to the highest marks of distinction; and the reader will find how often I shall have occasion to quote him in the subsequent parts of this work. "The elephant is used in dragging artillery over mountains; and it is on such occasions that his sagacity is most conspicuous. When the oxen, yoked to a cannon, make an effort to pull it up a declivity, the elephant pushes the breach with his front, and, at each effort, he supports the carriage with his knee, which he places against the wheel. He seems to understand what is said to him. When his conductor wants him to execute any painful labour, he explains the nature of the operation, and recites the reasons which ought to induce him to obey. If the elephant shows a repugnance to what is exacted of him, the *cornack*, which is the name of the conductor, promises to give him arrack, or some other thing that he likes. But it is extremely dangerous to break any promise that is made to him: many cornacks have fallen victims to indiscretions of this kind. On this subject, a fact, which happened at Decan, deserves to be related, and though it has the appearance of incredibility, it is, notwithstanding, perfectly true. An elephant, out of revenge, killed his cornack. The man's wife, who beheld the dreadful scene, took her two infants and threw them at the feet of the enraged animal, saying, *Since you have slain my husband,*

take my life also, as well as that of my children. The elephant instantly stopped, relented, and, as if stung with remorse, took the eldest boy in its trunk, placed him on its neck, adopted him for its cornack, and would never allow any other person to mount it.

“ If the elephant is vindictive, he is not ungrateful. A soldier at Pondicherry was accustomed to give a certain quantity of arrack to one of these animals every time he got his pay ; and, having one day intoxicated himself, and being pursued by the guard, who wanted to put him in prison, he took refuge under the elephant, and fell fast asleep. The guard in vain attempted to drag him from this asylum ; for the elephant defended him with its trunk. Next day the soldier, having recovered from his intoxication, was in dreadful apprehensions when he found himself under the belly of an animal so enormous. The elephant, which unquestionably perceived his terror, caressed him with its trunk.

“ The elephant is sometimes seized with a kind of madness, which deprives him of all tractability, and renders him so formidable, that it is often necessary to kill him. The people try to bind him with large iron chains, in the hope of reclaiming him. But, when in his ordinary state, the most acute pains will not provoke him to hurt those who have never injured him. An elephant, rendered furious by the wounds it had received at the battle of Hambour, ran about the field making the most hideous cries. A soldier,

notwithstanding the alarms of his comrades, was unable, perhaps on account of his wounds, to fly. The elephant approached, seemed afraid of trampling him under its feet, took him up with its trunk, placed him gently on his side, and continued its route."

These notes I have transcribed verbatim. They were communicated to the marquis de Montmirail by M. de Bussy, who resided ten years in India, and performed many important services to the state. He had several elephants under his own charge, often rode upon them, and had daily opportunities of observing many others, which belonged to his neighbours. Hence these notes, as well as all the others quoted under the name of M. de Bussy, merit every degree of credit. The members of the Royal Academy of Sciences have also left us some facts which they learned from those who had the management of the elephant at Versailles, and which deserve a place in this work. "The elephant seemed to know when it was mocked by any person; and remembered the affront till an opportunity of revenge occurred. A man deceived it by pretending to throw something into its mouth: the animal gave him such a blow with its trunk as knocked him down, and broke two of his ribs. After which, it trampled on him with its feet, broke one of his legs, and, bending down on its knees, endeavoured to push its tusks into his belly; but they luckily run into the ground on each side of his thigh, without doing him any injury. A painter wanted to

draw the animal in an unusual attitude, with its trunk elevated, and its mouth open. The painter's servant, to make it remain in this position, threw fruits into its mouth, but generally made only a feint of throwing them. The elephant was enraged, and, as if it knew that the painter was the cause of this teasing impertinence, instead of attacking the servant, it eyed the master, and squirted at him such a quantity of water from its trunk, as spoiled the paper on which he was drawing.

“ This elephant generally made less use of its strength than its address. With great ease and coolness, it loosed the buckle of a large double leathern strap, with which its leg was fixed; and, as the domestics had wrapt the buckle round with a small cord, and tied many knots on it, the creature deliberately loosed the whole, without breaking either the cord or the strap. One night, after disengaging itself in this manner from its strap, it broke open the door of its lodge with such dexterity as not to waken the keeper. From thence it went into several courts of the menagery, forcing open doors, and throwing down the walls when the doors were too narrow to let it pass. In this manner it got access to the apartments of other animals, and so terrified them, that they fled into the most retired corners of the enclosure.”

In fine, that nothing may be omitted which can contribute to throw light upon the natural and acquired faculties of an animal so superior to all others, we shall add some facts, ex-

tracted from the most respectable and unsuspecting travellers.

“ Even the wild elephant,” says le P. Vincent Marie, “ has his virtues. He is generous and temperate; and, when rendered domestic, he is esteemed for gentleness and fidelity to his master, friendship to his governor, &c. If destined to the immediate service of princes, he recognises his good fortune, and maintains a gravity of demeanour corresponding to the dignity of his office. If, on the contrary, less honourable labours are assigned to him, he turns melancholy, frets, and evidently discovers that he is humbled and depressed. In war, during the first onset, he is fiery and impetuous. When surrounded with hunters, he is equally brave. But, after being vanquished, he loses all courage. He fights with his tusks, and dreads nothing so much as to lose his trunk, which, from its consistence, is easily cut. . . . I shall only add, that the elephant is mild, attacks no person without being injured, seems to love society, is particularly fond of children, whom he caresses, and appears to discern the innocence of their manners.”

“ The elephant,” says Pyrrard *, “ is an animal of so much knowledge and judgment, that, beside his infinite utility to man, he may be said to enjoy a certain portion of reason. • When about to be ridden, he is so obedient and well trained, that he accommodates his behaviour to

* Voyage de François Pyrrard, tom. ii. p. 368.

the quality of the person he serves. He bends down, and assists his master to mount with his trunk. . . . He is so tractable, that he will perform any thing that is required of him, provided he be treated with gentleness. . . . He does every thing he is desired, caresses those who ride on him," &c.

"By giving elephants," say the Dutch voyagers*, "whatever is agreeable to them, they are soon rendered as tame and submissive as men. They may be said to be deprived of the use of language only. . . . They are proud and ambitious; but they are so grateful for benefits received, that, as a mark of respect, they bow their heads in passing the houses where they have been hospitably received. . . . They allow themselves to be led and commanded by a child†; but they love to be praised and caressed. They quickly feel an injury or an affront; and the guilty person should be on his guard; for he may reckon himself happy if they content themselves with squirting water upon him with their trunks, or simply throwing him into a mire."

"The éléphant," P. Philippe remarks‡, "makes a near approach to the judgment and reasoning of man. When compared with the apes, they appear to be stupid and brutal animals.

* *Voyage de la Compagnie des Indes de Hollande, tom i.*
p. 413.

† *Idem, tom vii.* p. 31.

‡ *Voyage d'Orient du P. Philippe de la Très-Sainte Trinité,* p. 306.

The elephants are so extremely modest, that they will not copulate in the presence of any person; and if, by accident, any man perceives this operation, they infallibly resent it, &c. . . . Their salute is performed by bending the knees, and lowering the head; and, when their master wants to mount them, they assist him with great dexterity. When a wild elephant is taken, the hunters tie his feet, and one accosts and salutes him, makes apologies for binding him, protests that no injury is meant, tells him, that, in his former condition, he often wanted food, but, that, henceforward, he shall be well treated, and that every promise shall be performed to him, &c. The hunter no sooner finishes this soothing harangue, than the elephant follows him like a tamed lamb. We must not, however, conclude from hence, that the elephant understands language, but only that, having a very strong discerning faculty, he distinguishes esteem from contempt, friendship from hatred, and all the other emotions which men exhibit to him; and for this reason he is more easily tamed by arguments than by blows. . . . With his trunk he throws stones very far, and very straight, and also uses it for pouring water on his body when bathing."

"Of five elephants," Tavernier remarks*, "which the hunters had taken, three escaped, though ropes and chains were thrown round their bodies and limbs. The natives told us the following most astonishing story, if it could be

* Voyage de Tavernier, tom. iii. p. 239.

credited. When an elephant, they said, has once been caught in a pitfall, and escapes from the snare, he becomes extremely diffident, breaks off a large branch with his trunk, and strikes the ground every where before he sets down his feet, in order to discover by the sound whether there are any concealed holes by which he may be entrapped a second time. For this reason, the hunters who related this story despaired of being able, without much difficulty, to retake the three elephants which had made their escape.

Each of the two elephants which had been seized was placed between two tame ones, and surrounded by six men with burning torches, who spoke to the animals, and, presenting food to them, said, in their language, *take this, and eat it*. The food consisted of small bunches of hay, pieces of black sugar, and boiled rice mixed with pepper. When the wild elephant refused to do what he was desired, the men ordered the tame elephants to beat him, which they performed, the one striking him on the front and head, and, if the captive animal attempted to defend himself, the other struck him on the side; so that the poor creature knew not where he was, and soon found himself obliged to obey."

"I have frequently remarked," says Edward Terry *, "that the elephant performs many actions which seem to proceed more from reason than from instinct. He does every thing that his master commands: if he wants to terrify any

* Voyage to the East Indies, by Edward Terry, p. 15.

person, he runs upon him with every appearance of fury, and, when he comes near, stops short, without doing him the smallest injury. When the master chooses to affront any man, he tells the elephant, who collects water and mud with his trunk, and squirts it upon the object pointed out to him. The trunk is composed of cartilage, hangs between the tusks, and is by some called his *hand*, because, on many occasions, it answers the same purpose as the human hand. . . . The Mogul keeps some elephants who serve as executioners to criminals condemned to death. When the conductor orders one of these animals to dispatch the poor criminals quickly, he tears them to pieces in a moment with his feet. But, if desired to torment them slowly, he breaks their bones one after another, and makes them suffer a punishment as cruel as that of the wheel."

From comparing the male and female elephants, the former of which we saw in the year 1771, and the latter in 1773, it appears, that, in general, the parts of the female are grosser and more fleshy. Her ears, indeed, are proportionally smaller than those of the male: but her body is more swollen, her head larger, and her members more rounded.

Like all other animals, the female elephant is more gentle than the male. Our female even caressed people with whom she was unacquainted. But the male is often formidable: the one we saw in 1771 was fiercer, less affectionate, and more ungovernable than this female. In a state

of repose, the genitals of the male appear not externally: his belly seems to be perfectly smooth; and it is only at the time of discharging urine, that the extremity of the penis comes out of the sheath. This male elephant, though equally young with the female, was, as formerly remarked, more difficult to manage. He endeavoured to lay hold of people who approached too near, and often tore their clothes. Even his governors were obliged to act with caution; but the female obeyed with complacence and alacrity. The only time she exhibited marks of displeasure was when her keepers forced her into a covered waggon, in order to be carried from one town to another. When they wanted her to enter, she refused to advance, and they could only accomplish their purpose by pricking her behind. Irritated by this ill treatment, and being unable to turn herself in her prison, she had no other method of revenge but to fill her trunk with water, and throw it in torrents upon those who had teased her.

We might quote many other facts equally curious and interesting. But we should soon exceed the limits we have prescribed to ourselves in this work. We should not even have given so long a detail, if the elephant had not been; in many respects, the chief animal in the brute creation, and who, of course, merited the greatest attention.

M. Daubenton has made several useful remarks on the nature and qualities of ivory, and has restored to the elephant those prodigious

tusks and bones which have been attributed to the mammoth. I acknowledge that I was long doubtful with regard to this point. I had often compared these enormous bones with the skeleton of nearly a full grown elephant preserved in the Royal Cabinet: and as, before composing their history, I could not persuade myself that there existed elephants six or seven times larger than the one whose skeleton I had so often examined, and as the large bones had not the same proportions with the corresponding bones of the elephant, I believed, with the generality of naturalists, that these huge bones belonged to a much larger animal, the species of which had been lost or annihilated. But it is certain, from the facts formerly mentioned, that there are elephants fourteen feet high, and, consequently, (as the masses are as the cubes of the height), six or seven times larger than that whose skeleton is in the Royal Cabinet, and which was not above seven, or seven and a half feet high. It is likewise certain, that age changes the proportions of bones, and that adult animals grow considerably thicker, though their stature does not increase. In fine, it is certain, from the testimonies of travellers, that there are elephants' tusks, each of which weighs more than 120 pounds*.

* Mr. Eden informs us, that he measured several elephants' tusks, which he found to be nine feet long; that others were as thick as a man's thigh; and that some of them weighed ninety pounds. It is said, that, in Africa, some tusks have been found, each of which weighed 125 pounds. . . . The English voyagers brought from Guinea the head of an ele:

From all these facts, it is apparent, that the prodigious bones and tusks above taken notice of, are really the tusks and bones of the elephant. Sir Hans Sloane * says the same thing; but brings no proof of the fact. M. Gmelin affirms it still more positively †, and gives some curious facts

phant, which Mr. Eden saw in the possession of Mr. Judde: it was so large, that the bones and cranium alone, without including the tusks, weighed about 200 pounds; from which it was computed, that the whole parts of the head, taken in their entire state, would have weighed 500 pounds. — *Hist. Gen. des Voyages*, tom. i. p. 223. Lopes amused himself in weighing several tusks of the elephant, each of which amounted to about 200 pounds. — *Idem*. tom. v. p. 79. The magnitude of elephants may be estimated by their tusks, some of which have been found to weigh 200 pounds. — *Drake's Voyage*, p. 104. In the kingdom of Loango, I purchased two tusks, which belonged to the same animal, and each of them weighed 126 pounds. — *Voyage de la Compagnie des Indes de Hollande*, tom. iv. p. 319. At the Cape of Good Hope, the elephant's teeth are very large, and weigh from sixty to 100 pounds. — *Descript. du Cap de Bonne Esperance*, par Kolbe, tom. iii. p. 12.

* Hist. de l'Acad. des Sciences, ann. 1727, p. 1.

† In Siberia, there are prodigious quantities of bones found in different places under the ground. This part of natural history is both curious and important: I have therefore collected all the facts I could learn upon this subject. Peter the Great, who was a patron of naturalists, gave orders to his subjects, in the year 1722, that, wherever any bones of the mammoth were discovered, the other bones belonging to the animal should be diligently sought for, and the whole sent to Petersburg. These orders were published in all the towns of Siberia, and, among others, in Jakutzk, where, after this publication, a stuschewoi, called *Wasilei Oltasow*, entered into a written obligation before Michael Petrowitsch Ismailow, captain-lieutenant of the guard, and woywode of the place, to

on the subject, which deserve to be here related. But M. Daubenton appears to be the first who

travel into the interior cantons of Lena, in order to search for the bones of the mammoth; and he was dispatched thither on the 23d of April the same year. The following year, another addressed the chancery of Jakutzk, and represented, that he had travelled along with his son toward the sea, in quest of the bones of the mammoth, and that, opposite to Surjatoi Noss, about 200 versts from that place and the sea, he found, in a turfy soil, which is common in these districts, the head of a mammoth, with one of the horns adhering to it; and in the neighbourhood there was another horn of the same animal, which had probably fallen off while the creature was alive; that, at a little distance, they drew out of the earth another head, with the horns, of an unknown animal; that this head resembled that of an ox, only it had horns above its nose; that, on account of an accident which befel his eyes, he was obliged to leave these heads where they were; and that, having heard of his majesty's orders, he now begged to be sent off with his son toward Vst-janskoje, Simowie, and the sea. His demand was complied with, and they were instantly dispatched. A third sluschewoi of Jakutzk represented to the chancery, in 1724, that he made a voyage on the river Jelou; that he was happy enough to discover, in a steep bank of this river, a fresh head of the mammoth, with the horn and all its parts; that he drew it out of the earth, and left it where he could find it again; and that he begged to be sent off with two men accustomed to such researches. The woywode accordingly consented. The Cossack soon after set out on his journey, and found the head, and all its parts, except the horns; for there remained only the half of one horn, which he brought, along with the head, to the chancery of Jakutzk. Some time after, he brought two horns of the mammoth, which he also found on the river Jelou.

The Cossacks of Jakutzk were extremely happy to find, under the pretext of going in quest of the bones of the mammoth, an opportunity of making such agreeable voyages. They were furnished with five or six post horses, when one

has put the matter beyond all doubt, by accurate mensurations, exact comparisons, and reason-

would have been sufficient, and they could employ the rest in carrying various articles of merchandise. Such an advantage was a great encouragement to adventurers. . . . A Cossack of Jakutzk, called *Jxanselsku*, petitioned the chancery to be sent to the Simowies of Alaseisch and Kowymisch, in quest of these kind of bones, and of true crystal. He had already sojourned in these places, had collected many curious objects, and actually sent to Jakutzk some of these bones. Nothing seemed more important than this expedition; and the Cossack was dispatched on the 21st day of April 1725.

Nasar-Koleschow, commissary of Indigirsk, in the year 1723, sent to Jakutzk, and from that to Irkutsk, the bones of a singular head, which, according to my information, was two archines *, having three wherschok, in length, one archine high, and armed with two horns and a tusk of the mammoth. This head arrived at Irkutsk on the 14th day of October, 1723; and I found the history of it in the chancery of that town. I was also assured, that the same man afterwards sent a horn of the mammoth.

These facts, collected from different sources, regard, in general, the same species of bones; namely, 1. All the bones in the Imperial Cabinet of Petersburg, under the name of *mammoth bones*, will be found, upon examination, to have a perfect resemblance to those of the elephant. 2. From what has been above related, it appears, that there have been found in the earth, heads of an animal totally different from an elephant, and which, particularly in the figure of the horns, resembled the head of an ox more than that of an elephant. Besides, this animal could not be so large as an elephant; and I have seen a head of it at Jakutzk, which had been sent from Anadirskoi-Ostrog, and was, according to my information, perfectly similar to that found by Portn-jagin. I myself had one from Hainskoi-Ostrog, which I sent to the Imperial Cabinet at Petersburg. In fine, I learned, that, on the banks of

* An archine is a Russian ell.

ings derived from the extensive knowledge he has acquired in the science of comparative anatomy.

Nischnaja-Tunguska, similar heads are not only found every where dispersed, but likewise other bones, which unquestionably belong not to the elephant, such as shoulder bones, ossa sacra, ossa innominata, hip bones, and leg bones, which probably belonged to the same animal to which the above head ought to be attributed, and which should by no means be excluded from the ~~ox~~ kind. I have seen leg and hip bones of this species, concerning which I have nothing particular to remark, except that they appeared to be extremely short in proportion to their thickness. Thus in Siberia, two kinds of bones are found in the earth, of which none were formerly esteemed, but those which perfectly resembled the tusks of the elephant. But, after the imperial order, the whole began to be examined; and, as the first gave rise to the fable of the mammoth, the last have also been indiscriminately ranked under the same class. Neither must we believe with Isbrand-Ides, and the followers of his reveries, that it is only in the mountains which extend from the river Ket to the north-east, and, consequently, likewise in the environs of Mangasca and Jakutzk, where the elephants' bones are to be found: for they appear not only through all Siberia, not excepting its most southern districts, as in the superior cantons of the Irtsch, Toms, and Lena, but are dispersed in different parts of Russia, and even in many places of Germany, where they are called, with much propriety, by the name of *fossil-ivory*; for they have a perfect resemblance to elephants' teeth, except that they are in a corrupted state. In temperate climates, these teeth are softened, and converted into fossil-ivory; but in countries frequently frozen, they are generally found very fresh. From this circumstance the fable, that these and other bones are often found besmeared with blood, might arise. This fable has been gravely related by Isbrand-Ides, and, after him, by Muller (*Mœurs et Usages des Ostiaques, dans le Recueil des Voyages au Nord*, p. 382), who have been copied by others with equal confidence as if there had been no room for doubt: and as one fiction begets another, the

blood pretended to be found on these bones has produced the notion, that the mammoth is an animal which lives in Siberia below the ground, where it sometimes dies, and is buried under the rubbish. All this has been invented with the view to account for the blood pretended to be found on these bones. Muller gives a description of the mammoth. This animal, says he, is four or five yards high, and about thirty feet long. His colour is grayish; his head is very long, and his front very broad. On each side, precisely under the eyes, there are two horns which he can move and cross at pleasure. In walking, he has the power of extending and contracting his body to a great degree. His paws, in thickness, resemble those of the bear. Isbrandes-Ides is candid enough to acknowledge, that he never knew any person who had seen the mammoth alive. . . . The heads and other bones which correspond with those of the elephant, unquestionably once constituted real parts of that animal. To this abundance of elephants' bones we cannot refuse our assent; and I presume that the elephants, to avoid destruction in the great revolutions which have happened in the earth, have been driven from their native country, and dispersed themselves wherever they could find safety. Their lot has been different. Some longer, and others shorter after their death, have been transported to great distances by some vast inundation. Those, on the contrary, who survived and wandered far to the North, must necessarily have fallen victims to the rigours of the climate. Others, without reaching so great a distance, might be drowned, or perish with fatigue. . . . The largeness of these bones ought not to astonish us. The tusks are sometimes four archines long, and six inches in diameter (M. de Strahlenberg says they have been seen nine inches in diameter), and the largest weigh from six to seven pounds. I mentioned, in another place, that fresh tusks have been taken from the elephant, which were ten feet long, and weighed a hundred, a hundred and forty-six, a hundred and sixty, and a hundred and sixty-eight pounds. . . . There are pieces of fossil-ivory which are yellowish, or grow yellow in the course of time; others are brown like cocoa-nuts, and more lustrous; and others are of a blackish blue colour. The tusks which have not been much affected with the frost in the

earth, and have remained some time exposed to the air, are subject to become more or less yellow or brown, and assume other colours according to the species of humidity with which the air is impregnated. M. de Strahlenberg also remarks, that pieces of these corrupted teeth are sometimes of a bluish black colour. . . . For the interest of natural history, it were to be wished, that, with regard to the other bones found in Siberia, we knew the animal to which they belong; but there is little hope of accomplishing this purpose. — *Relation d'un Voyage a Kamtschatka, par M. Gmelin, imprime en 1735 a Petersbourg, en Langue Russe.* The translation of this article was first communicated to me by M. de l'Isle, of the Academy of Sciences, and afterwards by the marquis de Montmirail.

ON THE FOSSIL REMAINS OF ELEPHANTS, &c.

BY THE EDITOR.

IN addition to the facts which M. de Buffon has brought forward respecting this curious part of natural history, I shall add such as at present suggest themselves to me, principally on the authority of Cuvier. This author, it must be acknowledged, has done more towards elucidating the osteology of the elephant, than any of his predecessors. I think I may venture to say this, without detracting in the least from the merits of Daubenton, of Pallas, of Camper, of Home, or of Blake: since Cuvier, in addition to his own observations, has been enabled to glean from all those who have gone before him. As the dry anatomical descriptions of animals has been purposely avoided by Smellie, in his translation of Buffon, I shall not trespass upon the plan by beginning the subject in this place; nevertheless, as it is my intention to conclude this account by attempting, after Cuvier, to determine the specific difference between the Asiatic and African elephant, I must claim the indulgence of the reader for making use of a few anatomical terms.

It is not at all surprising that fossil bones of

such a magnitude as those of the elephant, should fix the attention even of that part of the community, who are not apt to notice the phenomena of Nature: we accordingly find that whenever these bones are discovered by workmen, they are carefully collected; and this in some measure accounts for the number of instances upon record, of elephants' bones being found in several parts of the world. It ought here to be observed, that so good an opportunity to indulge in the marvellous has not been neglected, as there is no doubt that many a giant's bone, said to have been found in the earth, may be referred to this animal.

A circumstance which has greatly engaged the attention of naturalists, and which will probably remain a desideratum, is, the amazing distance at which these fossil bones are found, from those parts of the world at present inhabited by living elephants. The observations of Patrin on this point, appear to be more ingenious than satisfactory. He reasonably supposes that the mountains were, in the early ages of the world, much higher than they are at present; and that the rivers corresponded in size to this elevation: but that the remains of elephants, of buffaloes, of rhinoceroses, which have been found in Siberia, owe their translation from their native country to the effects of rivers, is more than can readily be allowed. If this supposition could be admitted in some instances, it must be denied in others, especially where, as in England and Ireland, the country is completely separated from the continent, without

a possibility of a communication, by means of its rivers, with either Asia or Africa.

The river Irtisch, says Patrin, arises in Chinese Tartary, towards the forty-third degree of latitude: the Ob and the Yenessey, about the forty-seventh; and when the mountains of Thibet, and those which nourish the Indus and Ganges, were much higher than they are at present, the waters which they poured from their northern sides, proceeded to unite themselves to the Siberian rivers. In those times, the ocean, which was higher than it now is, also covered part of the plains of India, and thus confined the elephants to more elevated situations, from whence their remains were washed down into other countries.

To indulge in this speculation (however interesting), would lead me beyond the limits of my present intention; I shall therefore proceed to notice the principal places where the remains of elephants have been met with; in doing which, it will be seen that the bones are almost constantly found in the neighbourhood of rivers. There is scarcely, says professor Pallas, in all Asiatic Russia, from the Don to the extremity of Cape Tchukotskoi, any river (especially if it runs into the plains), on the banks, or in the bed of which, we do not find several bones of elephants, and of other animals foreign to the climate.

Four pieces of tusks were found in the year 1664, in digging a foundation at the entrance of the Vatican in Rome. Thomas Bartholin speaks of discoveries of bones made in Rome before this

period; and it is probable that the body of Evander, found in 1141 and 1054, mentioned by Calmet in his Dictionary of the Bible, was nothing less than some bones of this animal.

Fortis mentions a tusk found by chance in a vineyard, and several discovered near the Tiber, in the environs of Rome. In April, 1802, a tusk was found in a vineyard near the Gate del Popolo, with several fragments of ivory and other bones.

Bonanni also speaks of many great bones, of teeth, and of lower jaws, dug up, in his time, on the Aurelian Way, about twelve miles from Rome.

In 1663, the Grand Duke Ferdinand de Medicis discovered an entire skeleton in the plain of Arezzo.

In the Florentine Museum, there is a humerus which was found in the mud at the mouth of the Arno, with several oysters adhering to it. Many other bones have been found at different times in the environs of that river. Dolomieu says that the elephants' bones of the vale of Arno, are found at the base of the argillaceous hills which fill up the intervals of the calcareous chains: that the beds which enclose them support a sort of wood, which he supposes to be oak, part of which is petrified and part bituminous; and that the bones themselves are covered by layers of marine shells, mixed with arundinaceous plants, and by immense beds of clay.

In the year 1691, about six leagues from Salonichi, in Greece, some large bones were found,

which would admit the arm of a man into their cavity. The humerus was two feet eight inches in circumference; a grinder, seven inches and a half high, weighing fifteen pounds, and three other teeth, weighing from two to three pounds each.

An elephant's grinding tooth was found in 1760 near St. Valier, within half a mile of the Rhone; it was imbedded in a gravelly soil mixed with pebbles, at the height of eighty feet above the surface of the river.

On approaching the Pyrenees, we find other remains of elephants, particularly on the sides of the Black Mountain.

A great number of bones, of teeth, and of portions of elephants' tusks, together with the remains of a species of hyæna, have been found in digging a garden at Fouvent, a village near Gray, in the department of the Saone.

There are, in the museum at Paris, some elephants' remains, which were discovered by the workmen employed to dig a canal near that city. Cuvier says that they were found in a black earth eighteen feet below the surface: there was also a skull which had been broken by the workmen, and of which Cuvier has the fragments; as well as of many bones of a kind of ox, and of other great ruminating animals, especially, a very remarkable cranium of an unknown species of antelope. The yellow sand above the bones, contained many fresh-water shells of the genus *Helix*.

Germany abounds in elephants' bones. *Merck*

reckoned eighty places in the year 1784 where the remains of these animals had been found, besides more than one hundred specimens of bones of unknown animals. M. de Zach enumerated more than one hundred places, and Blumenbach has doubled his number.

The skeleton of an elephant was dug up at Tonna, a town in the principality of Gotha; and it is remarkable that another was found, in 1799, within twenty yards of the same spot; both the skeletons were fifty feet below the surface of the ground. It must be noticed that Tonna is situated in the bottom of a valley washed by the river Unstrut, and that the necks of this valley are formed of horizontal beds of soft calcareous tufa, containing bones, stags' horns, impressions of different leaves, supposed to belong to the aquatic plants of the country, and fresh-water shells, resembling the *Helix stagnalis* and other species. The skeleton of 1799 was lying in a curved direction, with the hind-legs near the tusks.

The little town of Canstadt, situated on the river Neckar in the Duchy of Wurtemberg, is equally famous for the number of elephants' bones which have been found there.

The entire skeleton of an elephant was discovered in 1742 by Dr. Kœnig, at Osterode, near the Hartz mountain; and in 1773 the scapula and radius of a rhinoceros were found in the same place.

Many fossil remains of elephants have been found in the British islands.

Sir H. Sloane had a tusk found imbedded in

gravel, twelve feet under the surface of the ground, in Gray's Inn Lane. He was also in possession of another, dug up in Northamptonshire, besides other bones belonging to the elephant, which were found in the same county.

Two teeth and a portion of a skull were discovered in 1630 at Gloucester.

Trentham in the county of Suffolk, Wrabness near Harwich, Norwich, Kew, Salisbury Plain, the Isle of Sheppey, and the Isle of Dogs, have all furnished specimens of elephants' bones. Brentford must not be omitted, where the teeth of a hippopotamus, and the entire tusk of an elephant, nine feet long, were discovered by some workmen employed by Mr. Trimmer.

Pennant mentions two great grinding teeth, and part of the tusk of an elephant, which were given him by some miners, who discovered them at the depth of forty-two yards, in a lead mine, in Flintshire. They were imbedded in gravel, and the grinders, he observes, were almost as perfect as if just taken from the animal; the tusk much decayed, soft, and exfoliating.

The bones of elephants have been found in several of the northern parts of Ireland.

In Scandinavia, in Norway, and in Iceland, fossil bones of the same animal are said to have been found. Russia, beyond all other countries, is famous for these curiosities, particularly the Siberian part of it, as may be seen by Buffon's note, attached to the account of the elephant.

The bones of elephants have been found

both in North and South America: those discovered in the former division of that great continent, may be chiefly referred to the mammoth; but a piece of a tusk, decidedly, according to Cuvier, belonging to the true elephant, was found in Quito, at the height of 1,117 toises above the level of the sea.

These few instances, which I have selected from a vast number upon record, of the existence of elephants' bones, will at least serve to show how generally those substances have been disseminated, and how difficult it must be to explain the phenomenon in a satisfactory manner.

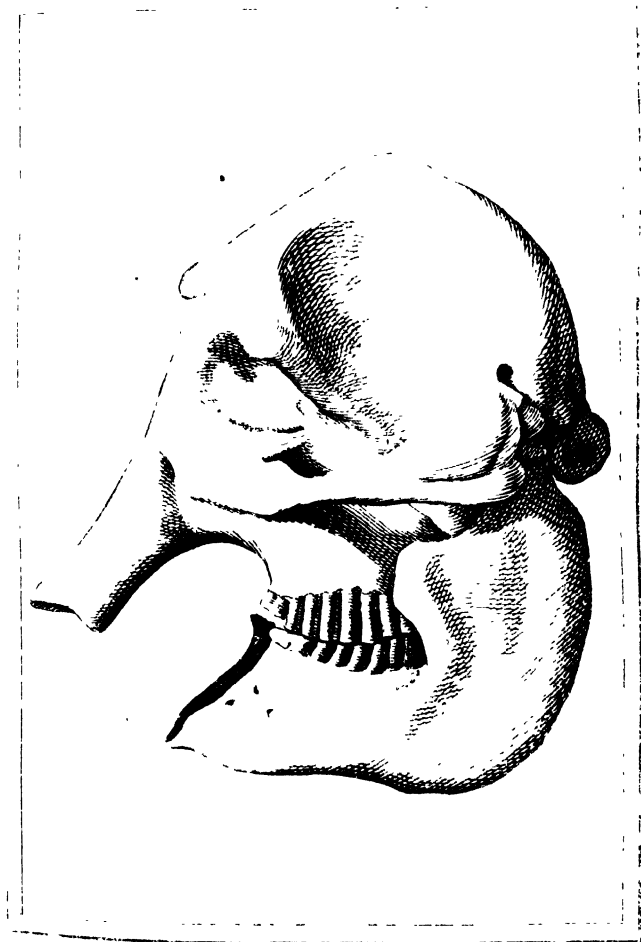
*The Asiatic compared with the African Elephant,
in order to establish a specific Difference
between the two Animals.*

The characters which particularly distinguish these elephants from each other, are the different shape of the head, the arrangement of the furrows in the grinding teeth, and the external form of the ears.

Cuvier, to whose excellent memoir I am indebted for the figures which have been added to this account, has had an opportunity to examine seven heads; five of Indian elephants, and two of the African kind. With his usual accuracy, he has entered into a minute anatomical account of each; but it will be sufficient, in this place, to give merely the leading and most striking features which distinguish the two.



SKULL *of the* INDIAN ELEPHANT



SKULL *of the* AFRICAN ELEPHANT.

A slight inspection of the two heads, when seen laterally, will satisfy any one of the difference between them; the top of the skull being so much lower in the African than in the Asiatic species. This distinction in the upper part of the cranium, arises from the different inclination of the frontal line, which falls much farther back in the African elephant, where it makes, with the occipital line, an angle of 115° , than in the elephant of India, in which the angle does not exceed 90° .

The frontal bone also in the Indian elephant is evidently concave, whereas, in the African kind, it is, on the contrary, rather convex.

These two observations will be fully sufficient for the reader to distinguish the skulls of the different species in a general way, but a character equally obvious, must not be omitted, arising from the superficial form of the grinding teeth. We have long been in possession of indistinct accounts of the molar teeth both of Indian and African elephants, without their having ever been compared with a view to their particular difference. Neither Buffon nor Linnæus supposed that there was more than one species of elephant; nor are we enlightened in this respect by Gmelin, who, in his enlarged edition of the *Systema Naturæ*, has confined himself to the *Elephas maximus*, without even hinting at a distinct species. The first truly specific distinction, as far as relates to the intimate structure of the teeth, is wholly due to professor Camper, who has sufficiently illustrated the difference in his plates, although he has written nothing on the subject.

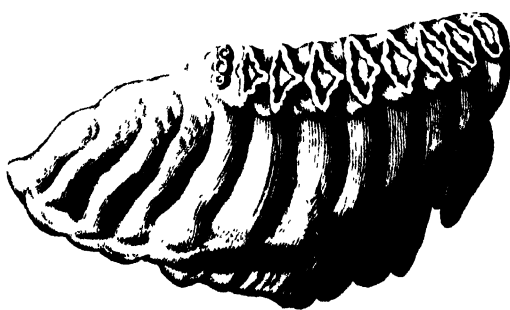
In the Indian elephant, the crown of the molar tooth has a certain number of furrows upon it, with ridges of enamel placed in a direction parallel to each other; while, in the African species, the enamel seen on the surface of the grinder is constantly disposed in lozenge-shaped figures; so that a single inspection of the large tooth, will be sufficient at once to determine the different species, and enable the observer, without hesitation, to name the kind of elephant to which it belonged.

The next character, and the last which I shall mention, is derived from the size of the ears, and is of course visible only in the living or stuffed animal.

In the Indian elephant, this feature is of a moderate size; while, in the African species, it is so enormous as to cover all the shoulder: an ear, cited by Cuvier, preserved in the cabinet of the king of Denmark, and taken from an elephant killed at the Cape of Good Hope, in 1675, was three feet and a half long, and two and a half broad.

Thus I conceive there cannot remain a doubt about the propriety of separating the two elephants: the difference is obvious; and, when assisted by the plates, added for the purpose of illustrating these observations, must strike any one who pays the least attention to the subject. —I have subjoined the following specifications, including the two most distinctive characters, in as few words as possible:

ELEPHAS ASIATICUS. *Cranium productum:*



TEETH *of the* INDIAN *and* AFRICAN ELEPHANT.

dentium molarium corona lineis fere parallelis undulatis, distincta.

ELEPHAS AFRICANUS. *Cranium fere rotundum: dentium molarium corona rhombea, distincta.*

It was my intention to conclude these observations with the above description of the two species of elephants; but, led on by the subject, and being unwilling wholly to neglect the remains of a kindred animal, which has lately excited so much curiosity in the world, I shall add a short account of the quadruped whose bones have been found in different parts of North America. I must here observe, that the name of mammoth, applied by ourselves and the Americans to this animal, as well as to some fossil bones found in Siberia, has been rejected by Cuvier, who confines the mammoth to Siberia, and forms a new genus from the American skeleton. He founds his generic character, as well as his Greek name of *mastodonte*, upon the particular conformation of the grinding teeth; but I cannot help remarking, that, in this instance, M. Cuvier has been led away by the inclination to form new genera, which at present prevails in France, more, perhaps, to the prejudice, than the advancement of natural history. The *mastodonte*, as far as can be judged from its bones, is clearly an elephant, differing specifically in the formation of its molar teeth, but no more entitled to a generic distinction on that account than either the Asiatic or African elephant.

Cuvier has given the following head to his chapter on this animal :

SUR LE GRAND MASTODONTE *.

Animal très-voisin de l'éléphant, mais à machelières hérissées de gros tubercules, dont on trouve les os en divers endroits des deux continens, et surtout près des bords de l'Ohio, dans l'Amérique Septentrionale, improprement nommé *Mammoth* par les Anglais, et par les habitans des États-Unis.

Although several detached portions of this large quadruped's bones have been collected at different times since the year 1712, and a particular description given of a lower jaw by the late Dr. Hunter, in the Philosophical Transactions for the year 1768; yet no complete skeleton of the animal was ever put together, till M. Peale, of Philadelphia, with indefatigable pains, collected more than bones enough for the purpose. These remains were chiefly discovered in a marl pit, in New York, at about sixty-seven miles from the capital, in the neighbourhood of Newburg, on Hudson's river. For some particular parts, Mr. Peale was obliged to search in other places; and, at length, after several fruitless attempts, he succeeded to his satisfaction, and formed two almost complete skeletons, the

* Annales du Museum d'Histoire Naturelle, tom. viii. p. 270.

most perfect of which was placed in the museum at Philadelphia, and the other sent to London to be publicly exhibited.

The most celebrated depot, however, for the remains of this animal, is to the left of the Ohio, at about four miles from the river, and thirty-six from the mouth of the Kentucky. They are found in a salt-water marsh, the bottom of which is covered with a black and stinking mud: the bones occur in the mud, and on the edges of the marsh.

There is something extremely curious in a discovery of the mastodonte, which has been recently made in Virginia.

Professor Barton received the account (dated from Williamburg, in Virginia, the 6th of October, 1805), the substance of which is as follows: At five feet and a half under the earth, on a bed of lime-stone, were found a number of bones almost sufficient to construct a skeleton. One of the teeth weighed seventeen pounds. But what constitutes the great singularity of this discovery is, that, in the middle of this collection of bones, there was seen a half-powdered mass of small branches of trees, of different grasses, and of leaves, among which was discovered a species of reed, at present growing in Virginia. The whole appeared to be wrapped in a sort of bag, which is supposed to have been the stomach of the animal, so that it can scarcely be doubted that these were the remains of the food which this creature had devoured.

There is a curious account of the discovery of

an entire mammoth, or mastodonte, in the *Philosophical Magazine* for November, 1807, communicated by sir Joseph Banks. The body of this animal was first noticed in the year 1799, by a Tongous chief, named Schoumachoff. This man, while coasting along the shores of the Frozen Sea, perceived an unformed block in the midst of a rock of ice, the nature of which he could not determine to his satisfaction. The next year, he found that the mass he had seen before, was freer from ice, and by the side of it he remarked two similar pieces, which were the feet of a mammoth; but it was not till after five succeeding years were expired, that the curiosity of Schoumachoff was fully gratified. During this period, the ice, which enclosed the mastodonte, having partly melted, the level became sloped, and this enormous mass, pushed forward by its own weight, fell over upon its side on a sand bank. In the year 1806, Mr. Adams, of Petersburg, was informed of this discovery, while he was staying at Yakoutsck, in Siberia, and immediately determined to visit the spot. After travelling for several days over a dreary tract of country, chiefly upon the back of a rein-deer, he at length arrived at the object of his journey, which was still lying in the same place, but completely mutilated. The inhabitants of the neighbourhood had fed their dogs with the flesh, and it had likewise been preyed upon by different wild animals, some of whose burrows were seen near the mammoth. The skeleton, almost completely unfleshed, was entire, with the ex-

ception of one of the fore-feet. Some of the bones were still slightly attached by the ligaments of the joints, and by strips of skin on the exterior side of the carcase. The head was covered with a dry skin, and one of the ears, well preserved, was furnished with a tuft of bristles. The parts least damaged, were a fore-foot and a hind one: they were covered with skin, and had still the sole attached. Mr. Adams is in possession of three-fourths of the skin, which he describes as covered with a reddish hair and black bristles: he adds, that it was of such an extraordinary weight, that ten persons, who were employed to carry it to the sea-side, in order to stretch it on floating wood, moved it with great difficulty. The entire carcase, the bones of which were collected on the spot, is four Russian ells and a half high, and seven long, without comprehending the two horns, each of which measures a toise and a half in length, and both together weigh 400 pounds. The head alone weighs 460 pounds.

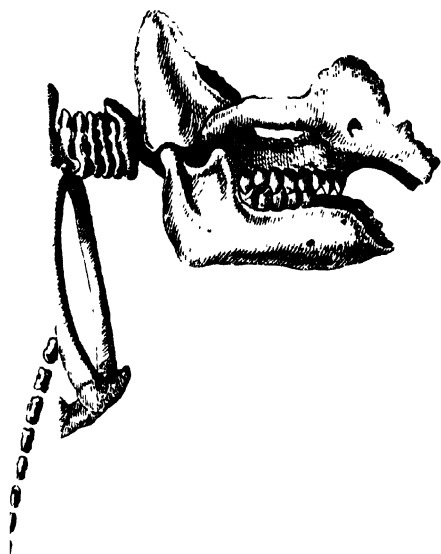
A small portion of the skin was sent to sir J. Banks, which was very offensive when it arrived. It has since been deposited in Hunter's museum.

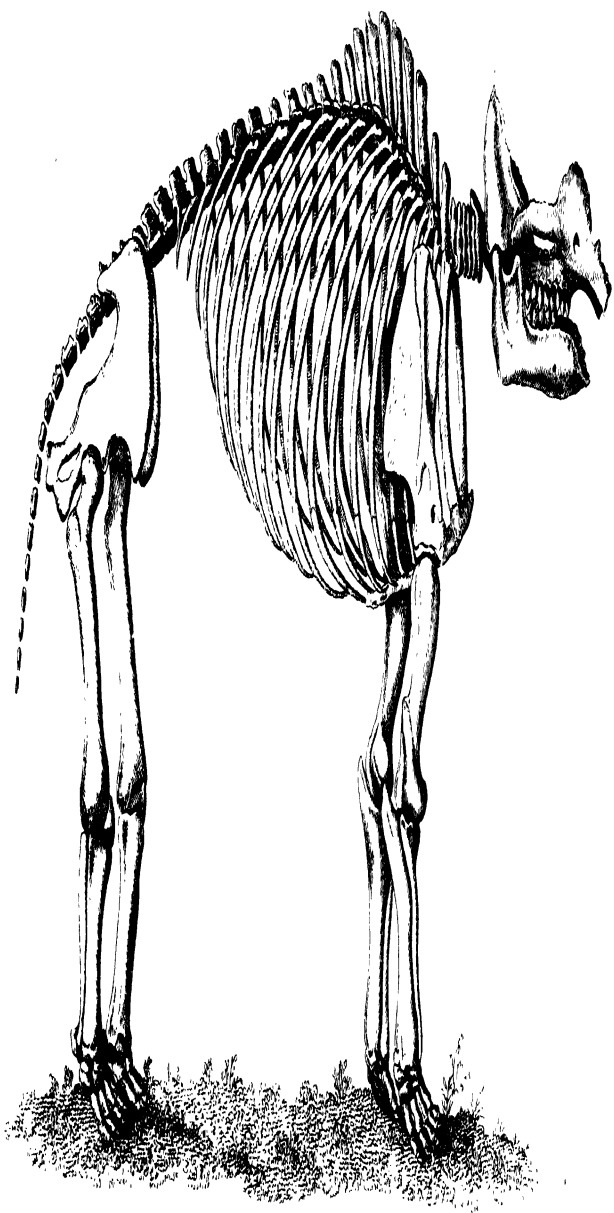
There is certainly a singular difference of shape between the teeth of the mastodonte and those of the common elephant: the enamel likewise that covers the osseous part of the molar-teeth is remarkably thick, and well fitted for grinding down the radical parts of vegetables, upon which

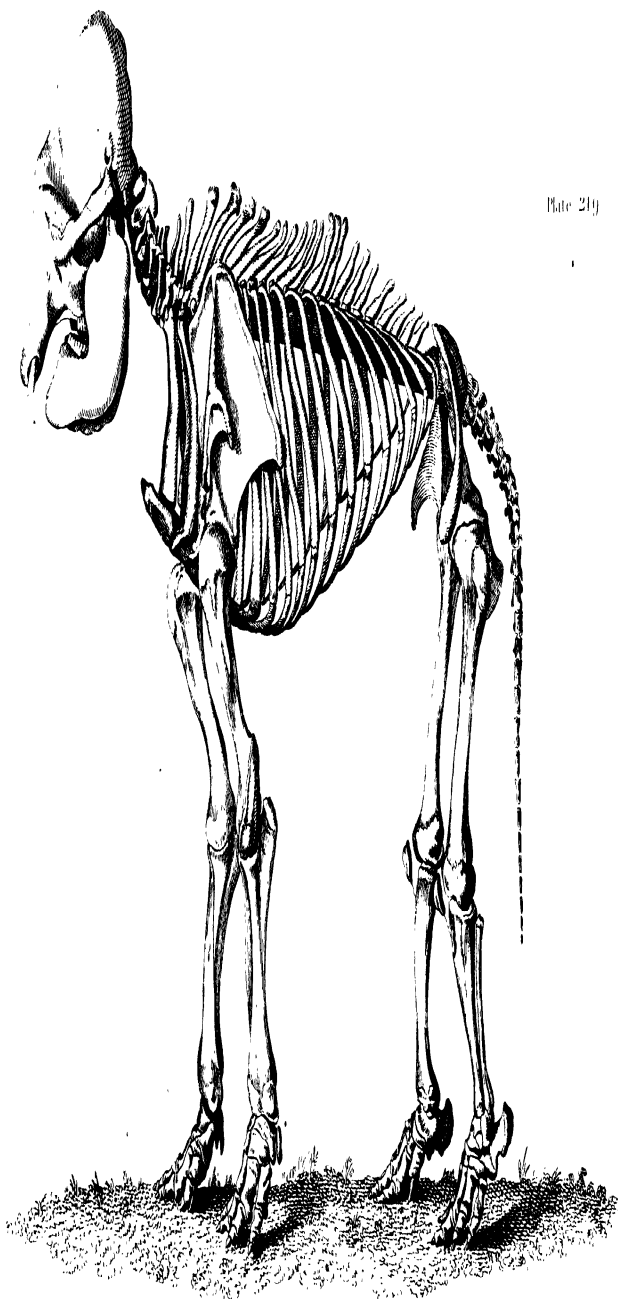
this animal has been supposed chiefly to subsist. The mere inspection of the plates which M. de Buffon has added to his facts and arguments, will be sufficient to render any particular description of the teeth unnecessary, as they clearly show the tuberculated structure of the crown, and thus point out the distinction between *them* and the grinders of the present existing elephants.

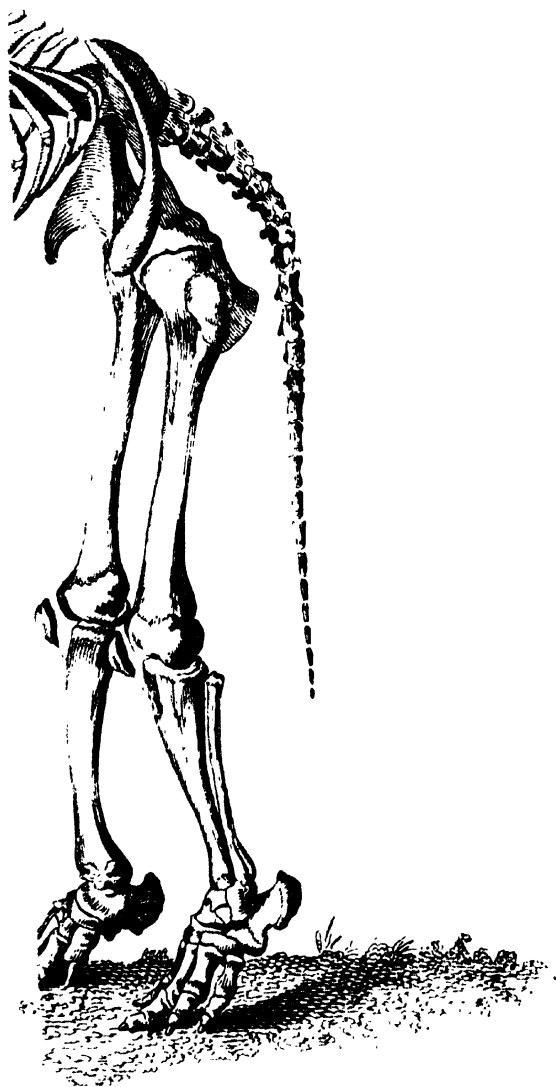
The skeleton of the mastodonte put together in America, measured eleven feet in height, and fifteen feet in length. In this respect the animal from the Ohio differs from the elephant, which is never so much longer in proportion to its height.

All the observations that Cuvier has made on the mastodonte, consisting principally of a minute description of its bones, tend to confirm the following result. That this great animal very much resembles the elephant in every part of its osteology, the grinding teeth excepted: that, in all probability, it has a trunk: that, in height, it does not exceed the common elephant, but is rather longer, and a little thicker in the limbs: that, like the hippopotamus and wild boar, it feeds in preference upon the roots, and fleshy parts, of vegetables: that, in consequence of this choice, it repairs to the marshy places; nevertheless, it is not formed for swimming or living in the water like the hippopotamus, but is truly a terrestrial animal: that the bones are much more common in North America than elsewhere; that they appear fresher, and are found in better pre-









THE RHINOCEROS*.

NEXT to the elephant, the rhinoceros is the strongest quadruped. He is at least twelve feet long, from the extremity of the muzzle to the

* CHARACTER GENERICUS.

Cornu solidum perenne conicum, naso insidens, cum osse non cohærens.

Pedes ungulati.

CHARACTER SPECIFICUS.

RHINOCEROS UNICORNIS. R. cornu unico. — *Linna. Syst. Nat. Gmel.* i. p. 57.

Rhinoceros cornu unico conico. — *Gron. Zooph.* i. p. 4. No. 13.

RHINOCEROS. — *Plin.* lib. viii. c. 20. — *Gess. Quadr.* p. 842. — *Ray's Synops.* p. 122. — *Klein. Quadr.* p. 26. — *Grew, Mus.* p. 29. — *Worm. Mus.* p. 336. — *Briss. Quadr.* p. 78. — *Phil. Trans. Abrid.* vol. ix. p. 93. — *Kolben,* vol. ii. p. 101.

LE RHINOCEROS. — *Buff. Hist. Nat. par Sonn.* xxviii. p. 283, pl. 9.

RHINOCEROS. — *Parson's Phil. Trans.* vol. xlii. — *Edwards,* pl. 221. — *Penn. Hist. Quadr.* i. p. 154. — *Shaw's Gen. Zool.* i. p. 198, pl. 60.

HABITAT

inter et prope tropicos in paludosis.

W.

The rhinoceros has one large horn, sometimes two, placed



RHINOCEROS.

origin of the tail, and the circumference of his body is nearly equal to his length*. In magni-

near the end of the nose; it is sometimes three feet and a half long, black, and smooth. The upper lip is long, hangs over the lower, ends in a point, is very pliable, and serves to collect its food, and deliver it into the mouth. The nostrils are placed transversely. The ears are large, erect, and pointed. The eyes are small and dull. The skin is naked, rough, or tuberculated, and lies about the neck in vast folds. There is another fold from the shoulders to the fore-legs, and another from the hind part of the back to the thighs. The skin is so thick and so strong as to turn the edge of a scimitar and resist a musket ball. The tail is slender, flattened at the end, and covered on the sides with very stiff, thick, black hairs. The belly hangs low. The legs are short, strong, and thick. The hoofs are divided into three parts, each pointing forward.

—*Penn. Synops. Quadr.* p. 75.

Though the name of this animal be entirely Greek, it was unknown to the ancient Greeks. Aristotle takes no notice of it. Strabo is the first Greek, and Pliny the first Roman author who mentions it. The rhinoceros probably did not frequent that part of India into which Alexander had penetrated, though he met with great numbers of elephants; for it was about 300 years after Alexander, that Pompey first brought this animal to Europe.

Rhinocerote, in Italian; *Abada*, in Portuguese.

* I have in my possession a figure of a rhinoceros, drawn by an officer of the Shaftesbury East India vessel in the year 1737. The figure corresponds very well with mine. The animal died in the passage from the East Indies to Britain. This officer had written the following note at the bottom of the figure. "His back was about seven feet high. His colour resembled that of a hog, whose skin is beginning to dry after wallowing in the mire. He had three hoofs on each foot. The folds of his skin lay backward on each other. Between these folds were harboured insects, millepeds, scorpions, small serpents, &c. He was not above three years old when his figure was drawn. His penis, when extended, spread out in the form of a flower de luce." In a corner of the plate I

tude, therefore, he makes a near approach to the elephant; and he appears to be much less, only because his legs are proportionally shorter than those of the elephant. But he differs still more from the elephant in his natural powers and intelligence; for Nature has bestowed on him nothing that elevates him above the ordinary rank of quadrupeds. He is deprived of all sensibility in his skin; neither has he hands to enable him to improve by the sense of touching; and instead of a trunk, he has only a moveable lip, to which all his means of dexterity or address are limited. His chief sources of superiority over other animals consist in his strength, his magnitude, and the offensive weapon on his nose, which is entirely peculiar to him. This weapon is very hard horn, solid throughout its whole extent, and situated more advantageously than the horns of ruminating animals, which defend only the superior parts of the head and neck. But

have given a figure of the penis. As this figure was communicated to me by Dr. Tyson, I had not an opportunity of consulting the author, whether these noxious insects, which he says take up their abode in the folds of the animal's skin, were seen by himself, or whether he only related what had been told him by the Indians. I acknowledge that the fact appears very singular.—*Edwards's Gleanings*, p. 25. Note, This last fact is not only doubtful, but that of the animal's age, compared with his largeness, appears to be false. We saw a rhinoceros of, at least, eight years of age, which exceeded not five feet in height. Mr. Parsons saw one of two years, which was not higher than a heifer, which may be computed at about four feet. How, then, could the rhinoceros above taken notice of be only three years old, if it was seven feet high?

the horn of the rhinoceros preserves from insult the muzzle, the mouth, and the face. For this reason, the tiger will rather attack the elephant, whose trunk he lays hold of, than the rhinoceros, whom he dare not face, without running the risk of having his bowels torn out; for the body and limbs of the rhinoceros are covered with a skin so impenetrable, that he fears neither the claws of the tiger or lion, nor the sword or shot of the hunter. His skin is blackish, being of the same colour, but thicker and harder than that of the elephant, and is not sensible to the stings of flies. He can neither extend nor contract his skin, which is rolled up into large folds at the neck, the shoulders, and the crupper, in order to facilitate the motion of his head and limbs, which last are massy, and terminated by large feet, armed with three great toes. His head is proportionably longer than that of the elephant; but his eyes are still smaller, and seldom above half open. The upper, which projects over the under lip, is moveable, and can be stretched out about six or seven inches in length; and it is terminated by a pointed appendix; which gives this animal a power of collecting herbage in handfuls, as the elephant does with its trunk. This muscular and flexible lip is a kind of hand or imperfect trunk; but it enables the creature to seize any object with force, and to feel with some dexterity. Instead of those long ivory tusks which constitute the armour of the elephant, the rhinoceros has a formidable horn, and two strong incisive teeth in each jaw. These teeth,

of which the elephant is deprived, are situated at a great distance from each other, one in each angle of the jaw. The under jaw is square before; and there are no other incisive teeth in the anterior part of the mouth, which is covered by the lips. But beside the four cutting teeth, in the four corners of the mouth, there are twenty-four grinders, six on each side of the two jaws. He holds his ears always erect; in figure they resemble those of the hog; but they are proportionally smaller. The ears are the only parts of the body on which there are hairs, or rather bristles. The extremity of the tail, like that of the elephant, is garnished with a bush of large, solid, hard bristles.

Dr. Parsons, a celebrated physician in London, to whom the republic of letters is much indebted for many valuable discoveries, in natural history, and to whom I owe the highest acknowledgments for the marks of esteem and friendship with which he has been pleased to honour me, published, in the year 1743, a history of the rhinoceros, from which I shall the more willingly make extracts, because every composition of that gentleman merits the attention and confidence of the public.

Though the rhinoceros was frequently exhibited in the Roman spectacles, from the days of Pompey to those of Heliogabalus; though he has often been transported into Europe in more modern times; and though Bontius, Chardin, and Kolben, have drawn figures of him both in India and Africa; yet so ill was he represented

and described, that he was very imperfectly known till the errors and caprices of those who had published figures of him were detected by inspection of the animals which arrived in London in the years 1739 and 1741. The figure given by Albert Durer was the first, and the least conformable to Nature; yet it was copied by most naturalists, some of whom loaded it with preposterous drapery and foreign ornaments. That of Bontius is more simple and correct; but the inferior part of the legs is improperly represented. That of Chardin, on the contrary, gives a pretty good idea of the feet, and the folds of the skin; but, in other respects, it has no resemblance to the animal. That of Camerarius is no better; neither is that drawn from the rhinoceros exhibited at London in the year 1685, and which was published by Carwitham in the year 1739. In fine, the figures on the ancient pavement of Præneste, and on Domitian's medals, are extremely imperfect; but they have the merit of not being deformed by the imaginary ornaments represented in the figure drawn by Albert Durer. Dr. Parsons has taken the trouble of drawing this animal himself* in three different views, before,

* One of our learned philosophers, M. de Mours, has made some remarks on this subject, which must not be omitted. "The figure," says he, "of the rhinoceros which Dr. Parsons has added to his memoir, and which he drew from the life, is so different from that engraved at Paris in the year 1749, from a rhinoceros exhibited at the fair of St. Germain, that it is difficult to recognise them to be the same animal. That of Dr. Parsons is shorter, and the folds of the skin are fewer in number, less marked, and some of

behind, and in profile. He has likewise drawn the male organs of generation, the single and

them placed in a different position. The head, particularly, has hardly any resemblance to that of the St. Germain rhinoceros. We cannot, however, entertain a doubt with regard to the accuracy of Dr. Parsons. The reasons of such remarkable differences must be sought for in the age and sex of the two animals. That of Dr. Parsons was drawn from a male rhinoceros, which exceeded not the age of two years. That which I have here added, was drawn from a picture of the celebrated M. Oudry, a most distinguished animal painter. He painted from the life, and of the natural size, the St. Germain rhinoceros, which was a female, and at least eight years old; I say at least eight years; for we see by an inscription written on the bottom of a wooden print, entitled, *A true portrait of a living rhinoceros exhibited at the fair of St. Germain in Paris*, that this animal, when taken, in 1741, in the province of Assem, belonging to the Mogul, was three years old: and, eight lines lower, it is said, that the animal was only one month old when some Indians entangled it with ropes, after having slain the mother by their spears and darts. Hence it must have been at least eight years of age, and might be ten or twelve. This difference of age is probably the reason of the remarkable differences between Dr. Parsons's figure and that of M. Oudry, whose picture, executed by the order of the king, was exhibited in the painter's hall. I shall only remark, that M. Oudry has made the horn of his rhinoceros too long; for I examined the animal with great attention, and I find that this part is better represented in the wooden print. The horn of the present figure was drawn after this print, and the rest is copied from M. Oudry's picture. The animal which it represents was weighed, about a year before, at Stouquart, in the duchy of Wirtemberg, and its weight was at that time five hundred pounds. It eat, according to the relation of Captain Dowenot Wan-derneer, who conducted it to Europe, sixty pounds of hay, and twenty pounds of bread, every day. It was very tame, and surprisingly agile, considering the enormity of its mass, and its

double horns, as well as the tail, from other rhinoceroses, whose parts are preserved in the cabinets of natural history.

The rhinoceros which came to London in the year 1739, was sent from Bengal. Though not above two years of age, the expense of his food and journey amounted to near one thousand pounds sterling. He was fed with rice, sugar, and hay. He had daily seven pounds of rice, mixed with three pounds of sugar, and divided into three portions. He had likewise hay and green herbs, which last he preferred to hay. His drink was water, of which he took large quantities at a time. He was of a peaceable disposition, and allowed all parts of his body to be touched. When hungry or struck by any person, he became mischievous, and, in both cases, nothing appeased him but food. When enraged, he sprung forward, and nimbly raised himself to a great height, pushing, at the same time, his head furiously against the walls, which he performed with amazing quickness, notwithstanding his heavy aspect and unweildy mass. I often observed, says Dr. Parsons, these movements produced by rage or impatience, especially in the mornings before his rice and sugar were brought to him. The vivacity and promptitude of movements, Dr. Parsons adds, led me to that he is altogether unconquerable, and that he

unweildy aspect." These remarks, like all those of M. de Mours, are judicious and sensible. See the figure in his French translation of the Philosophical Transactions, ann. 1743.

could easily overtake any man who should offend him.

This rhinoceros, at the age of two years, was not taller than a young cow that has never produced. But his body was very long and very thick. His head was disproportionally large. From the ears to the horn there is a concavity, the two extremities of which, namely the upper end of the muzzle; and the part near the ears, are considerably raised. The horn, which was not yet above an inch high, was black, smooth at the top, but full of wrinkles directed backward at the base. The nostrils are situated very low, being not above an inch distant from the opening of the mouth. The under lip is pretty similar to that of the ox; but the upper lip has a greater resemblance to that of the horse, with this advantageous difference, that the rhinoceros can lengthen this lip, move it from side to side, roll it about a staff, and seize with it any object he wishes to carry to his mouth. The tongue of this young rhinoceros was soft, like that of a calf*. His eyes had no vivacity: in figure, they resembled those of the hog, and were situated lower, or nearer the nostrils, than in any other

voyagers and all naturalists, both ancient and all us, that the tongue of the rhinoceros is very rough, and its papillæ so sharp, that with the tongue alone, he tore the flesh from a man's body even to the bones. This fact, which is every where related, appears to be very suspicious and ill imagined; because the rhinoceros does not eat flesh, and animals, in general, which have rough tongues, are seldom carnivorous.

quadruped. His ears are large, thin at the extremities, and contracted at their origin by a kind of annular rugosity. The neck is very short, and surrounded with two large folds of skin. The shoulders are very thick, and, at their juncture, there is another fold of skin, which descends upon the fore-legs. The body of this young rhinoceros was very thick, and pretty much resembled that of a cow about to bring forth. Between the body and crupper there is another fold, which descends upon the hind-legs. Lastly, another fold transversely surrounds the inferior part of the crupper, at some distance from the tail. The belly was large, and hung near the ground, particularly its middle part. The legs are round, thick, strong, and their joint bended backwards. This joint, which, when the animal lies, is covered with a remarkable fold of the skin, appears when he stands. The tail is thin, and proportionally short; that of the rhinoceros so often mentioned, exceeded not sixteen or seventeen inches in length. It turns a little thicker at the extremity, which is garnished with some short, thick, hard hairs. The form of the penis is very extraordinary. It is contained in a prepuce or sheath, like that of the horse; and the first thing that appears in the time of erection, is a second prepuce, of a flesh-colour, from which there issues a hollow tube, in the form of a funnel cut and bordered somewhat like a flower de luce*, and constitutes the glans and extremity of the

* Phil. Trans. No. 470, pl. 111; Edwards's Gleanings.

penis. This anomalous glans is of a paler flesh-colour than the second prepuce. In the most vigorous erection, the penis extends not above eight inches out of the body; and it is easily procured by rubbing the animal with a handful of straw when he lies at his ease. The direction of this organ is not straight, but bended backward. Hence he throws out his urine behind; and, from this circumstance, it may be inferred, that the male covers not the female, but that they unite with their cruppers to each other. The female organs are situated like those of the cow, and she exactly resembles the male in figure and grossness of body. The skin is so thick and impenetrable, that, when a man lays hold of any of the folds, he would imagine he is touching a wooden plank of half an inch thick. When tanned, Dr. Grew remarks, it is excessively hard, and thicker than the hide of any other terrestrial animal. It is every where covered more or less with incrustations in the form of galls or tuberosities, which are pretty small on the top of the neck and back, but become larger on the sides. The largest are on the shoulders and crupper, and are still pretty large on the thighs and legs, upon which they are spread all round, and even on the feet. But, between the folds, the skin is penetrable, delicate, and as soft to the touch as silk, while the external part of the fold is equally hard with the rest. This tender skin between the folds is of a light flesh-colour; and the skin of the belly is nearly of the same colour and consistence. These galls or tuberosi-

ties should not be compared, as some authors have done, to scales. They are simple indurations of the skin only, without any regularity in their figure, or symmetry in their respective positions. The flexibility of the skin in the folds enables the rhinoceros to move with facility his head, neck, and members. The whole body, except at the joints, is inflexible, and resembles a coat of mail. Dr. Parsons remarks, that this animal listened with a deep and long continued attention to any kind of noise, and that, though he was sleeping, eating, or obeying any other pressing demands of nature, he raised his head and listened till the noise ceased.

In fine, after giving this accurate description of the rhinoceros, Dr. Parsons examines whether the rhinoceros, with a double horn, exists; and, having compared the testimonies of the ancients and moderns, and the remains of this variety in the collections of natural objects, he, with much probability, concludes, that the rhinoceroses of Asia have commonly but one horn, and that those of Africa have generally two.

It is unquestionably true, that some rhinoceroses have but one horn, and that others have two*. But it is not equally certain that this

* Kolben asserts positively, and as if he had been an eye-witness, that the first horn of the rhinoceros is upon the nose and the second upon the front, in a right line with the first; that the latter, which is brown, never exceeds two feet in length; and that the second is yellow, and seldom longer than six inches. — *Descript. du Cap de Bonne Esperance* tom. iii. p. 17. But we have already mentioned doubl

variety is constant, and depends on the climate of Africa or India; or that this difference is alone sufficient to constitute two distinct species. It appears that the rhinoceroses with one horn have this excrescence always longer than those with two. There are single horns of three and a half, and perhaps of above four feet in length, by six or seven inches diameter at the base. Some double horns are two feet long*. These horns are commonly of a brown or olive colour; though there are instances of their being gray, and even white. They have only a slight concavity in form of a cup under the base, by which they are fixed to the skin of the nose. The rest of the horn is solid, and harder than common horn. It is with this weapon that the rhinoceros is said to attack and sometimes mortally wound the largest elephants, whose tall legs give the rhinoceros an opportunity of striking, with his snout and horn, their bellies, where the skin is most tender and penetrable. But, if he misses his first blow, the elephant throws him on the ground and kills him.

horns, the second differing very little from the first, which was two feet long, and both were of the same colour. Besides, it appears to be certain, that they are never at such a distance from each other as this author has placed them; for the bases of the two horns, preserved in the cabinet of sir Hans Sloane, were not three inches asunder.

* *Ursus cornu gemino.* — *Martial, Spect. ep. 22.* — *Phil. Trans. Abrid.* vol. ix. p. 100; vol. xi. p. 910. — *Phil. Trans.* vol. lvi. p. 32, tab. 2. — *Flacourt, Hist. Madag.* p. 395. — *Lobo Abyss.* p. 230. *Rhinoceros bicornis.* — *Linn. Syst. Nat.* p. 104.

The horn of the rhinoceros is more esteemed by the Indians than the ivory of the elephant, not on account of its real utility, though they make several toys of it with the chisel and turner's lathe, but on account of certain medicinal qualities they ascribe to it *. The white horns, being rarest, are in great request. Among the presents sent by the king of Siam to Lewis XIV.

* Sunt in regno Bengalén rhinocerotes Lusitanis *Abades* dicti, cujus animalis corium, dentes, caro, sanguis, ungulæ, et cæteræ ejus partes, toto genere resistunt venenis; qua de causa in maximo pretio est apud Indos. — In those parts of Bengal which border on the Ganges, the rhinoceroses, or unicorns, there called *Abades*, are very common, and numbers of their horns are brought to Goa. They are about two palms in circumference at the base, gradually taper to a point, and serve the animal as a defensive weapon. They are of an obscure colour, and the cups made of them are highly esteemed, especially if they have the power of counteracting poisonous liquors. — *Voyage du P. Philippe*, p. 371. Every part of the rhinoceros's body is medicinal. His horn is a powerful antidote against all kinds of poison; and the Siamese make a great article of traffic with it among the neighbouring nations. Some of them are sold for more than a hundred crowns. Those which are of a bright gray colour, and spotted with white, are most valued by the Chinese. — *Hist. Nat. de Siam, par Nic. Gervaise*, p. 34. The horns, teeth, toes, flesh, skin, blood, and even their urine and excrements, are in great request among the Indians, as powerful remedies for different diseases. — *Voyage de la Compagnie des Indes de Hollande*, tom. i. p. 417. His horn is placed between the two nostrils; it is very thick at the base, and terminates in a sharp point: it is of a greenish brown colour, and not black, as some authors maintain. When very gray or approaching to white, it brings a high price. But it is always pear, on account of the value put on it by the Indians. — *Ibid.* tom. vii. p. 277.

in the year 1686 *, were six horns of the rhinoceros. In the Royal Cabinet we have twelve, of different sizes ; and one of them, though cut, is three feet eight inches and a half long.

The rhinoceros, without being ferocious, carnivorous, or extremely wild, is, however, perfectly untractable †. He is nearly among large, what the hog is among small animals, rash and brutal, without intelligence, sentiment, or docility. He seems even to be subject to paroxysms of fury, which nothing can appease ; for the one which Emanuel king of Portugal sent to the pope in the year 1513, destroyed the vessel in which they were transporting him ‡ ; and the rhinoceros, which we lately saw in Paris, was drowned in the same manner in its voyage to Italy. Like the hog, these animals are fond of wallowing in the mire. They love moist and marshy grounds, and never quit the banks of rivers. They are found

* Among the presents sent by the king of Siam to France, in the year 1686, were six rhinoceros's horns, which were greatly valued over all the East. The Chevalier Vernati has written from Batavia to Britain, that the horns, teeth, toes, and blood of the rhinoceros, are antidotes, and that they are as much used in the Indian pharmacopœia as the theriaca in that of Europe. — *Voyag. de la Comp. des Ind. de Hol.* p. 481.

† Chardin says (tom. iii. p. 45) that the Abyssinians tame the rhinoceros, and train him to labour, like the elephants. This fact seems to be extremely suspicious : no other author mentions it ; and it is well known, that, in Bengal, Siam, and other southern parts of India, where the rhinoceros is, perhaps, still more common than in Æthiopia, and where the natives are accustomed to tame the elephants, he is regarded as an irreclaimable animal, of which no domestic use can be made.

‡ Philosophical Transactions, No. 470.

in Asia and Africa, in Bengal *, Siam †, Laos ‡, Mogul §, Sumatra ||, at Java in Abyssinia ¶, in Æthiopia **, in the country of the Anzicos ††, and as far as the Cape of Good Hope ††. But, in general, the species is not numerous, and much less diffused than that of the elephant. The female produces but one at a time, and at considerable intervals. During the first month, the young rhinoceros exceeds not the size of a large dog §§. When recently brought forth, it has no horn |||, though the rudiments of it appear

* Voyage du P. Philippe, p. 371; Voyage de la Compagnie des Indes de Hollande, tom. i. p. 417.

† Histoire Naturelle de Siam, par Gervaise, p. 33.

‡ Journal de l'Abbé de Choisy, p. 339.

§ Voyage de Tavernier, tom. iii. p. 97; Voyage d'Edward Terri, p. 15.

|| Histoire Generale des Voyages, par M. l'Abbé Prevôt, tom. ix. p. 339.

¶ Voyage de la Compagnie des Indes de Hollande, tom. vii. p. 277.

** Voyage de Chardin, tom. iii. p. 45; Relation de Thevenot, p. 10.

†† Histoire Generale des Voyages, par M. l'Abbé Prevôt, tom. v. p. 91.

‡‡ Voyage de Franc. le Guat. tom. ii. p. 145; Description du Cap de Bonne Esperance, par Kolbe, tom. iii. p. 15 et suiv.

§§ We have seen a young rhinoceros which was not larger than a dog. It followed its master every where, and drank the milk of the buffalo. But it lived only three weeks. The teeth were beginning to appear. — *Voyage de la Compagnie des Indes de Hollande*, tom. vii. p. 483.

||| In two young rhinoceroses, nothing but a prominence was observed on the place where the horns were to arise,

in the fœtus. At the age of two years, the horn exceeds not an inch in length *, and, at the age of six, it is from nine to ten inches long † : now, as some of these horns are known to be near four feet in length, it appears that they continue to grow during the half, or perhaps during the whole of the animal's life, which must be considerably long, since the rhinoceros described by Dr. Parsons had only acquired about one half of its height at the age of two years ; from which we may conclude, that this animal, like man, should live seventy or eighty years.

Without the capacity of becoming useful, like the elephant, the rhinoceros is equally hurtful by his voracity, and particularly by the great waste he makes in the cultivated fields. He is of no use till he is slain. His flesh is reckoned excellent by the Indians and Negroes ‡ ; and Kolbe says he often eat it with pleasure. His skin makes the hardest and best leather in the world § ; and not only his horn, but all the other

though the animals were then as large as an ox. But their legs are very short, especially those before, which are shorter than the hind-legs. — *Voyage de Pietro della Valle*, tom. iv. p. 245.

* Phil. Trans. No. 470.

† Id. *ibid.*

‡ The Indians eat the flesh of the rhinoceros, and reckon it excellent. They even derive advantage from his blood, which they collect with care as a remedy for diseases in the breast. — *Hist. Nat. de Siam, par Gervaise*, p. 35.

§ His skin is of a fine gray colour, approaching to black, like that of the elephant ; but it is rougher and thicker than

parts of his body, and even his blood*, urine, and excrements, are esteemed to be antidotes against poison, or remedies for particular diseases. These antidotes or remedies, extracted from different parts of the rhinoceros, are of equal use in the Indian pharmacopœia as the theriaca in that of Europe†. Most of the virtues ascribed to both are probably imaginary: but how many objects are in the highest repute, which have no value but in the opinions of men?

The rhinoceros feeds on the grossest herbs, as thistles and thorny shrubs, which he prefers to the soft pasture of the best meadows‡. He is fond of the sugar-cane, and likewise eats all kinds of grain. Having no appetite for flesh, he neither disturbs the small nor fears the large animals, but lives in peace with all, not excepting the tiger, who often accompanies the rhinoceros, without daring to attack him. This peaceful disposition renders the combats between the elephant and the rhinoceros very suspicious: such combats must at least be rare, since there is no

that of any other animal. . . . The skin is covered every where, except on the neck and head, with small knots or tubercles, &c. — *Voyage de Chardin*, tom. iii. p. 43.

* *Voyage de Mandelslo*, tom. ii. p. 350.

† *Voyage de la Comp. des Indes de Hollande*, tom. vii. p. 484.

‡ This animal feeds upon plants, and prefers brushwood, broom, and thistles. But of all plants he is fondest of a shrub which resembles the juniper, and is called the *rhinoceros shrub*. Great quantities of it grow on heathy lands and on the mountains. — *Descript. du Cap de Bonne Esperance*, par Kolbe, tom. iii. p. 17.

motive to war on either side. Besides, no antipathy has ever been remarked between these animals. They have been known, even in a state of captivity, to live peaceably together, without discovering any marks of resentment or antipathy *. Pliny, I believe, is the first author who mentions these combats between the elephant and rhinoceros. It appears that these animals were compelled to fight at the Roman spectacles†; and from hence, probably, the idea was formed, that, when in their natural state of liberty, they fight in the same manner. But every action without a motive is unnatural; it is an effect without a cause, which cannot happen but by accident.

The rhinoceroses assemble not, nor march in troops like the elephants. They are more solitary and savage; and it is, perhaps, more difficult to hunt, and to overcome them. They never attack men‡, unless they are provoked,

* The Dutch history entitled *l'Ambassade de la Chine*, gives a false description of this animal, especially when it exhibits the rhinoceros as the chief enemy of the elephant; for the rhinoceros I am mentioning was kept in the same stable with two elephants, and I have several times seen them near each other without discovering the smallest antipathy. An Æthiopian ambassador had brought this animal as a present. — *Voyage de Chardin*, tom. iii. p. 45.

† The Romans took pleasure in making the rhinoceros and elephant fight at their public shows. — *Singular. de la France Antarctique*, par André Theret, p. 41.

‡ The rhinoceros never attacks any person, nor becomes furious, unless he is provoked, and then his ferocity is tremendous; he grunts like a hog, and overturns trees and

when they become furious and formidable. Their skin is so hard as to resist sabres, lances, javelins, and even musket balls*. The only penetrable parts of the body are the belly, the eyes, and about the ears†. Hence the

every thing that comes in his way.—*Voyage de la Compagnie des Indes de Hollande*; tom vii. p. 278.

* His skin is thick, hard, and rough. . . . It is even impenetrable by the sabres of the Japanese, and coats of arms, bucklers, &c., are made of it.—*Id. Ibid.* p. 483. The rhinoceros seldom attacks man, unless when provoked, or the person wears a red habit. In both these cases, he becomes furious, and overturns every thing that opposes him. When these animals attack a man, they seize him by the middle of the body, and toss him up with such force, that he is killed by the fall. . . . However enraged he may be, it is easy to avoid his approach: he is indeed very swift; but he turns with great difficulty. Besides, according to my information, he sees only what is before him. Hence, when he comes within a few paces, we have only to step to a side; for he then loses sight of us, and it is very difficult for him to return in quest of us. I have experienced this fact, having more than once seen him advance toward me with all his fury.—*Descript. du Cap de Bonne Esperance, par Kolbe*, tom. iii. p. 17.

† It is difficult to kill him; and men never attack him without danger of being torn to pieces. Those who are accustomed to hunt the rhinoceros find means, however, to defend themselves from his fury; for he is fond of marshy grounds; they observe when he repairs thither, and, concealing themselves among the bushes opposite to the direction of the wind, they watch till he lies down either to sleep or to wallow, that they may have an opportunity of shooting him near the ears, where alone he can receive a mortal wound. They place themselves against the wind; because the scent of the rhinoceros is so acute, that he never approaches any object he perceives till the smell of it reaches his nostrils.—*Hist. Nat. de Siam, par Gervaise*, p. 35.

hunters, instead of attacking him face to face, follow him at a distance by the tracks of his feet, and watch till he lies down to sleep. We have, in the Royal Cabinet, a fœtus of a rhinoceros, which was extracted from the body of the mother, and sent to us from the island of Java. By the memoir which accompanied this fœtus, we are informed that twenty-eight hunters having assembled to attack the mother, they followed her at a distance for some days, detaching one or two of their number, from time to time, in order to reconnoitre her situation; that, by this means, they surprised her when asleep, and silently approached so near, that the whole twenty-eight muskets were discharged at once into the lower part of her belly.

From the description given by Dr. Parsons, it appears that this animal has an acute and very attentive ear. We are likewise assured that his sense of smelling is excellent. But it is said, that his eyes are not good, and that he sees such objects only as are before him *. The extreme

* See the preceding note. — The eyes of the rhinoceros are very small, and he sees only forward. When he walks, or pursues his prey, he proceeds always in a direct line, forcing, overturning, and piercing through every obstruction that falls in his way. Neither bushes, nor trees, nor thickets of brambles, nor large stones, can turn him from his course. With the horn on his nose, he tears up trees, raises stones high in the air, and throws them behind him to a considerable distance, and with a great noise: in a word, he overthrows every object which he can lay hold of. When he is enraged, and meets with no obstruction, lowering his head, he ploughs the

minuteness of his eyes, their low, oblique, and deep situation, the dullness, and the small degree of motion they seem to possess, tend to confirm this fact. His voice, when he is in a state of tranquillity, is blunt, and resembles the grunting of a hog; but, when enraged, it becomes sharp, and is heard at a great distance. Though he lives on vegetables only, he does not ruminate. Hence it is probable, that, like the elephant, he has but one stomach, and capacious bowels, which supply the place of many stomachs. His consumption of food, though considerable, is not near so great as that of the elephant; and it appears, from the density and uninterrupted thickness of his skin, that he also loses much less by perspiration.

I have seen a second rhinoceros, which was lately brought to the royal menagery. In the month of September, 1770, if the people who conducted it can be credited, the animal was only three months old. But, I am persuaded, that it was at least two or three years of age; for its body, including the head, was already eight feet two inches long, five feet six inches high, and eight feet two inches in circumference. A year afterward, its body was lengthened seven inches; so that on the 28th day of

ground, and throws large quantities of earth over his head. He grunts like a hog: his cry, when in a state of tranquillity, does not reach far; but, when in pursuit of his prey, it may be heard at a great distance. — *Descript. du Cap de Bonne Esperance, par Kolbe.*

August, 1771, it was eight feet nine inches, including the length of the head, five feet nine inches high, and eight feet nine inches in circumference. On the 12th day of August, 1772, the length of the body, comprehending the head, was nine feet four inches, the height of the crupper six feet four inches, and that of the withers only five feet eleven inches. Its skin had the colour and appearance of an old elm tree, spotted in some places with black and gray, and in others doubled into deep furrows, which formed a kind of scales. It had only one horn, the colour of which was brown, and its substance solid and hard. The eyes are small and prominent, the ears large, and pretty similar to those of an ass. The back, which was hollow, or depressed, seemed to be covered with a natural saddle. The legs were short and very thick. The feet were rounded behind, and divided before into three hoofs. The tail resembled that of an ox, and was garnished with black hairs at the extremity. The penis lay along the testicles, and erected itself for the discharge of urine, which the animal threw out to a great distance. The point of it was also very remarkable, forming a cavity like the mouth of a trumpet. The sheath from which it issues is fleshy, and of a vermillion colour, like the penis itself. This fleshy substance, which formed the first tube, came out of a second sheath composed of skin, as in other quadrupeds. The tongue is so hard and rough, that it tears off the skin of any per-

son whom it licks; hence this animal eats large thorns, without feeling any pain. The rhinoceros requires one hundred and sixty pounds of food every day. His flesh is much relished by the Indians and Africans, and especially by the Hottentots. If trained when young, he might be rendered domestic, and, in this state, he would multiply more easily than the elephant.

“ I could never discover the reason,” Mr. Parsons remarks, “ why in Asia the rhinoceros is allowed to remain in a wild state, while in Abyssinia he is rendered domestic, and is employed in carrying burdens *.”

“ M. de Buffon,” says Mr. Bruce, “ conjectured that there were, in the interior parts of Africa, rhinoceroses with two horns. This conjecture is fully verified; for all the rhinoceroses I saw in Abyssinia had two horns. The first, that is, the one nearest the nose, is of the common form; the second is sharp at the point, and always shorter than the first. Both spring at the same time; but the first grows more quickly, and exceeds the other in size, not only during the time of growth, but during the whole life of the animal †.”

On the other hand, M. Allamand, a very able naturalist, wrote to Mr. Daubenton a letter, dated at Leyden, October 31, 1766, in the following terms :

* *Defense des Recherches sur les Américains*, p. 95.

† Note communicated by Mr. Bruce to M. de Buffon,

“ I recollect a remark of Mr. Parsons, in a passage quoted by M. de Buffon: he suspected that the rhinoceroses of Asia have but one horn, and that those of the Cape of Good Hope have two. I suspect the very opposite: the heads of the rhinoceroses which I received from Bengal and other parts of India, had always double horns, and all those which came from the Cape of Good Hope had but one horn.”

This last passage proves what we have formerly remarked, that the rhinoceroses with double horns form a variety in the species, a particular race, which is found equally in Asia and Africa *

* All doubt, however, upon this subject is now banished, as we have abundant proof of the existence of two distinct species of rhinoceroses; the single-horned being confined to Asia, and the double horned to Africa. The skin of this last mentioned animal, unlike the other, is without any folds, but much granulated or warty. Its two horns are placed one behind the other; they are not connected to the bone of the nose, but grow in the muscular integuments which immediately cover it: this accounts for a singularity mentioned by Barrow in his Travels in Southern Africa; that, when the animal is browsing and undisturbed, the horns remain loose upon the nose; but the moment he is alarmed, they become perfectly stiff, and ready to act in the most offensive manner. The length of the fore-horn of one in the Philosophical Transactions, is twenty inches; of the second horn, nineteen; but they vary in size: the eyes, which are situated near the root of the larger horn, are extremely minute for so large an animal, but Nature has obviated the inconvenience which would otherwise result from their smallness, by placing them in projecting sockets, in which they turn in every



TWO-HORNED RHINOCEROS.

direction. There are a few stiff bristles scattered about the body, particularly about the ears, and on the end of the tail, which is singularly formed, being convex above and below, and flat on the sides. There are three hoofs on each foot, which project a little forward.

In its manners, this animal resembles the single horned species.

Naturalists are highly indebted to professor Pallas for the singular account which he has given of the entire body of a two-horned rhinoceros, dug up in a particular part of eastern Siberia. It was found buried within twenty yards of a river, in the ancient frozen soil, and was covered with its skin, flesh, and muscles.

Pallas tells us, that, when he arrived at Ireuth, in the month of March, 1772, he was presented, among other curiosities, with the head of an animal of considerable magnitude, entirely covered with its natural skin, and exhibiting the remains of tendons and ligaments. From the figure of the head, and the marks of the horns, he was immediately convinced that it belonged to the rhinoceros; and this opinion was afterwards more particularly confirmed by the inspection of two feet of the same animal, in which he distinctly saw the characteristic division of the toes of the rhinoceros: these feet were covered with the skin, and the greatest part of the fleshy fibres, so as to resemble a mummy.

The following is the account of this discovery, published by M. Argunoff, in the Russian language, in 1771, and transmitted to professor Pallas, in the month of February, 1772:

The body of an animal, half buried in the sand, was found in the month of December, 1771, in the bank of the river Willioni, under a sharp hill, at fifteen yards from the water. Its length was fifteen spans, and its height ten, as nearly as could be estimated. The commandant of the place asserts, that this animal is absolutely unknown to the inhabitants, and that nothing of the kind had ever been seen before in their country. The governor-general, having previously published an edict, by virtue of which all the curiosities discovered in his department should be transmitted to him, the head and the two feet of this animal were sent to Ireuth, in

good preservation. The remainder of the body, although still covered with its skin, was so rotten, that, after being left, it dissolved and disappeared ; except a third foot, which was sent to the prefecture of Jacut.

The professor gives a detailed account of the appearance of the parts which he received ; but it is not quite certain that this animal belonged to the African species, since the horns were not found with the head. Pallas, however, tells us, that the vestiges were evident, both of the nasal and frontal horn.

W



CAMEL.

THE CAMEL* AND DROMEDARY†.

THE names *camel* and *dromedary* signify not two different species, but only two distinct races of the camel, which have subsisted long pre-

* CAMELUS.

CHARACTER GENERICUS.

Cornua nulla.

Dentes primores inferiores sex, spathiformes.

Laniarii distantes; superiores tres, inferiores duo.

Labium superius fissum.

CHARACTER SPECIFICUS.

CAMELUS BACTRIANUS. *C. taphia* *desi* *duobus* — *Lin.*
Syst. Nat. Gmel. i. p. 169. — *Erzleb. Mamm.* p. 221.

CAMELUS TURCICUS. — *Alp. Aeg.* i. p. 223. t. 13. fig. dioc.

CAMELUS BACTRIANUS. — *Jour. Quadr.* p. 97.

CAMELUS. — *Gem. Quadr.* p. 162, fig. p.
Bris. p. 889.

LE CHAMEAU. — *Bull. Hist. Nat. par Sonn.* xxix. p. 1.
pl. 1.

PERSIAN CAMEL. — *Russel's Aleppo.* p. 57.

BACTRIAN CAMEL. — *Penn. Hist. Quadr.* i. p. 132. — *Shaw's*
Gen. Zool. ii. p. 239, pl. 167, — *Bew. Quadr.* p. 136.

vicious to the records of history. The chief, and perhaps the only sensible character by which these two races are distinguished, is, that

HABITAT

*ferus in India boreali et versus Sinense imperium in desertis;
Cultus in Oriente rarior occurrit.*

W.

The Bactrian camel has two bunches on the back, a small head, short ears, and a long, slender, bending neck. The height, to the top of the bunches, is six feet six inches. The hair is soft, longest about the neck, under the throat, and about the bunches. The colour of the hair on the protuberances is dusky, on the other parts it is a reddish ash-colour. The tail is long, the hair on the middle is soft, and coarse, black, and long on the sides. The hoofs are small; the feet flat, divided above, but not through. The bottom of the feet is excessively tough, yet pliant. There are six callosities on the legs, one on each knee; one on the inside of each fore-leg, on the upper joint; one on the inside of the hind-leg, at the bottom of the thigh; another on the lower part of the breast, the places that the animal rests on when it lies down. — *Penn. Synops. Quadr. p. 60.*

In Greek, *Καμηλος*; in Latin, *Camelus*; in Italian, *Camelo*; in Spanish, *Camelo*; in German, *Koemel*; in Hebrew, *Gamal*; in Chaldean, *Gamula*; in ancient Arabic, *Gemal*; in modern Arabic, *Gimel*; in French, *Chameau*. From these denominations, it appears, that the name of this animal has been adopted into modern languages, with little variation,

CAMELUS DROMEDARIUS. *C. topus dorsi unico.* — *Linm. Syst. Nat. Gmel. i. p. 168.* — *Erzleb. Mamm. p. 218.*

Camelus unico in dorso gibbo, seu dromedarius. — *Ray's Synops. Quadr. p. 143.*



DROMEDARY.

the camel has two bunches on the back, and the dromedary but one. The latter is also somewhat smaller and weaker than the camel. But both

CAMELUS ARABICUS. — *Arist. lib. ii. cap. 1.* — *Plin. lib. viii. cap. 18.*

CAMELUS DROMAS. — *Gesm. Quadr. p. 171, fig. p. 172.* — *Pr. Alp. Aeg. i. p. 223, t. 12, fig. bona.*

CAMELUS. — *Jonst. Quadr. p. 95, t. 42, 44, fig. bonæ, t. 43, fig. mala.*

CAMELUS VULGARIS. — *Forsk. Fn. Orient. p. 4.*

LE DROMEDAIRE. — *Buff. Hist. Nat. par Sonn. xxix. p. 1, pl. 2.*

CAMEL WITH ONE BUNCH. — *Pocock's Trav. i. p. 207.* — *Shaw's Trav. p. 239.* — *Russ. Hist. Aleppo. p. 56.*

ARABIAN CAMEL. — *Penn. Hist. Quadr. i. p. 129.* — *Shaw's Gen. Zool. ii. p. 1. pl. 1.* — *Bew. Quadr. p. 140.*

HABITAT

ferus in desertis Asiæ temperatæ. Cultus in Oriente, utilissimus pro itineribus in desertis arenosis siticulosus. Introductus quoque in Insulas Jamaicam et Barbados, at male cultus.

The Arabians and the inhabitants of Egypt, consider the flesh of the camel as a choice and wholesome food. In Barbary, the tongues, after being smoaked, are sent into Italy and other countries, where they are esteemed as very good eating. At Cairo a fine camel will sell for four or five hundred francs; but in Upper Egypt the same animal may be purchased for about half the money.

Camels are very common in Barbary; but the species becomes rare as we approach the western coast of Africa, and is scarcely to be met with beyond Cape Verd.

W.

The Arabian camel, or dromedary, has but one bunch on the back. In all other respects it is like the preceding, and is equally adapted for riding or carrying loads. — *Penn. Synops. Quadr. p. 62.*

In Greek, *Δρομας*, or rather *Camelus Dromas*; for *dromas*

of them intermix and produce; and the individuals which proceed from this crossing of the races, are the most vigorous, and preferred to all others *. These mongrels form a secondary race, which multiply among themselves, and

is only an adjective derived from *dromos*, which signifies *swiftness*, and *camelus dromas* is equivalent to the *swift running camel*: in modern Latin, *Dromedarius*; in the Levant, *Muihary*, according to Dr. Shaw.

* The Persians have several kinds of camels. Those with two bunches they call *bughur*, and those with one, *schuttus*. Of these last there are four kinds. Those called, from their excellence, *ner*, that is, *male*, which proceed from a mixture of a dromedary, or a camel with two bunches, and a female with one bunch, which is called *maje*, are never allowed to be covered by others, and are so highly esteemed, that some of them sell for a hundred crowns. They carry loads of nine or ten hundred pounds, and are most indefatigable. When in season, they eat little, foam at the mouth, grow enraged, and bite. To prevent them from hurting their keepers, the Persians put muzzles on their mouths, which are called *agrak*. The camels which proceed from this kind degenerate much, and become weak and indolent. It is for this reason that they are called *jurda kaidem* by the Turks, and sell at thirty or forty crowns only.

The third kind, called *lohk*, are not so good as the *bughur*. When in season, they foam not, but push out from under their throat a red bladder, which they again retract with their breath, raise their heads, and often swell. They sell at sixty crowns, and are by no means so strong as the other kinds. Hence the Persians, when they speak of a valiant man, say that he is a *ner*, and a poltroon is called *lohk*. A fourth kind are called by the Persians *schuturi baad*, and by the Turks *jeldovcsi*, that is, *wind camels*. They are smaller, but more sprightly than the other kinds; for, instead of walking, like ordinary camels, they trot and gallop as well as horses. — *Voyage d'Olearius*, tom. i. p. 550.

likewise mix with the primary races. Hence, in this species, as well as in those of other domestic animals, there are many varieties, the most general of which proceed from the influence of different climates. Aristotle* has marked the two principal races with much propriety; the first, or the one with two bunches, under the name of the *Bactrian camel* †, and the second under that of the *Arabian camel*. The first are called *Turkish camels* ‡, and the other *Arabian*

* *Camelus proprium, inter cæteros quadrupedes habet in dorso, quod tuber appellant, sed ita ut Bactrianæ ab Arabiis differant; alteris enim bina, alteris singula tubera habentur; Arist. Hist. Anim. lib. ii. cap. 1.* Theodore Gaza, whose translation I have uniformly followed when I quote from Aristotle, appears to have rendered this passage in an ambiguous manner; *Alteris enim bina, alteris singula tubera habentur*, signifies only that some have two, and others but one bunch; while the Greek text mentions expressly, that the Arabian camels have but one, and the Bactrian camels two bunches. Pliny likewise, who, in this article, as well as in many others, copies Aristotle, has translated this passage much better than Gaza; *Cameli Bactriani et Arabici differunt, quod illi bina habent tubera in dorso, hi singula.* — Plin. Hist. Nat. lib. viii. cap. 18. •

† Bactriana is a province of Asia, which now includes Turkestan, the country of the Usbecks, &c.

‡ We went to Mount Sinai upon camels, because there is no water on this road, and other animals cannot travel without drinking. . . . But the Arabian camels, which are small, and different from those of Cairo, who come from Sour, and other places, can travel three or four days without drink. . . . They travel from Cairo to Jerusalem, not only upon these small Arabian camels, but upon a larger kind, which are called *Turkish camels*. — *Voyage de Pietro della Valle*, tom. i. p. 360 et 408. In Barbary, the dromedary is called *maj-*

camels. This distinction still subsists; but, as many parts of Asia and Africa are now discovered, which were unknown to the ancients, it appears, that the dromedary is incomparably more numerous, and more generally diffused, than the camel. The latter is found only in Turkestan*, and some other places of the Levant†. But, in Arabia, the dromedary is more common than any other beast of burden. It is likewise very numerous in all the north-

hari; and is not so common in Barbary as in the Levant. . . . This species differs from the ordinary camel, by having a rounder and handsomer body, and only one small bunch on the back. — *Shaw's Travels*.

* The Academy having ordered the missionaries sent to China, in quality of king's mathematicians, to obtain information concerning some particulars in the history of the camel, the Persian ambassador gave the following answers to queries put to him by Mr. Constance: 1. That, in Persia, there were camels with two bunches on the back; but that they came originally from Turkestan, and belong to the race of those of which the king of the Moors had brought from that country, the only known part of Asia where this kind exists; and that those camels were highly esteemed in Persia, because their two bunches render them more proper for carriages. 2. That these bunches are not formed by a curvature of the back-bone, which is here as low as in any other part, but are only excrescences of a glandulous substance, similar to that which composes the udders of other animals; and that the anterior bunch is about six inches high, and the posterior an inch lower. — *Mem. pour servir a l'Hist. des Animaux*, part i. p. 80.

† The camels of the Calmuck Tartars are pretty large and strong; but they have all two bunches. — *Relation de la Grande Tartarie*, p. 267.

ern parts of Africa *, from the Mediterranean sea to the river Niger †. It is also found in Egypt ‡, in Persia, in South Tartary §, and in the northern parts of India. Thus the dromedary occupies immense territories, and the camel is confined within narrow limits. The first inhabits dry and hot regions, the second, countries which are less dry and more temperate; and the whole species, including both varieties, seems to be limited to a zone of three or four hundred leagues in breadth, extending from Mauritania to China; for, on either side of this zone, it has no existence. This animal, though a native of warm climates, dreads those which are excessively hot. The species terminates where that of the elephant commences; and it can neither subsist under the burning heat of the Torrid Zone, nor under the mild air of the Temperate,

* *Camelus animal blandum ac domesticum maxima copia in Africa invenitur, præsertim in desertis Lybiæ, Numidiæ, et Barbariæ. — Leon. Afric. Descript. Africa, vol. ii. p. 748.*

† The Moors have numerous flocks of camels upon the banks of the Niger. — *Voyage au Senegal, par M. Adanson, p. 36.*

‡ Audio vero in Ægypto longe plura quam quater centum milia camelorum vivere. — *Prosp. Alp. Hist. Nat. Egypt. part i. p. 226.*

§ Delectanter etiam Tartari Buratskoi re pecuaria, maxime camelis, quorum ibi magna copia est, unde complures a caravannis ad Sinam tendentibus redimunter, ita ut optimus camelus duodecim vel ad summum quindecim rubelis haberi possit. — *Novissima Sinica historiam nostri temporis illustrata, &c. edente G. G. L. p. 166.* Tartary abounds in cattle, and particularly in horses and camels. — *Voyage Historique de l'Europe, tom. vii. p. 204.*

It seems to be an original native of Arabia *; for this is not only the country where they are most numerous, but where they thrive best. Arabia is the driest country in the world, and where water is most rare. The camel is the most sober of all animals, and can pass several days without drink †. The soil is almost every where dry and sandy. The feet of the camel are adapted for walking on sands, and the animal cannot support itself on moist and slippery ground ‡. This soil produces no pasture; the

* Arabia is the native country of camels; for, though they are found in all places into which they have been carried, and even multiply in these places; yet there is no part of the earth where they are equally numerous. — *Voyage du P. Philippe*, p. 369. Tanta apud Arabes est camelorum copia, ut eorum pauperrimus decem ad minus camelos habeat: multique sunt quorum quisque quatuorcentum ac mille etiam numerare possit. — *Prosp. Alpin. Hist. Egypt.* p. 226.

† Without the assistance of camels, it would be extremely difficult to traverse the vast deserts of Solyma, where neither bird, wild beast, herbage, nor even a mushroom, can be found, and where nothing is to be seen but mountains of sand, rocks, and camels' bones. These animals sometimes pass six or seven days without drinking, which I should never have believed, if I had not seen the fact verified. — *Relation d'un Voyage de Poncet et Ethiopie; Lettres Edifiantes, Recueil* iv. p. 259. — In going from Aleppo to Ispahan, by the great desert, we travelled near six days without finding water, which, added to the three preceding, make the nine days I formerly mentioned, during which our camels had no drink. — *Voyage de Tavernier*, tom. i. p. 202.

‡ Camels cannot walk upon fat or slippery ground. They are only fit for sandy places. — *Voyage de Jean Obington*, tom. i. p. 222. — There are chiefly two kinds of camels, the one proper for warm countries, the other for cold. The ca-

ox is also wanting; and the camel supplies his place.

When we consider the nature and structure of these animals, we cannot be deceived with regard to their native country, which must be suited to their frame and temperament, especially when these are not modified by the influence of other climates. In vain have attempts been made to multiply them in Spain*; in vain have they been transported to America. They have neither succeeded in the one country nor in the other; and, in the East Indies, they are not found beyond Surat and Ormus. We mean not to say absolutely, that they cannot subsist and produce in India, Spain, and America, and even in colder countries, as those of France, Germany, &c.† By keeping them,

mels of very warm countries, as those which come from Ormus, and as far as Ispahan, cannot walk when the ground is moist and slippery; for, by the spreading of their hind-legs, they are in danger of tearing open their bellies: they are small, and carry loads of only six or seven hundred pounds, . . . The camels of colder countries, as those from Tauris to Constantinople, are large, and commonly carry burdens of one thousand pounds. They draw themselves out of miry ground; but, when the earth is fat and slippery, they are obliged to go, sometimes to the number of a hundred, at each other's sides, in order to pass over it. — *Voyage de Tavernier*, tom. i. p. 161.

* Camels are frequently seen in Spain. They are sent, by the governors of places, from the frontiers of Africa. But they never live long there; because the country is too cold for them. — *L'Afrique de Marmol*, tom. i. p. 50.

† M. le marquis de Montmirail informs me, that he was assured that the king of Poland had, in the neighbourhood of Dresden, camels and dromedaries which multiplied.

during the winter, in warm stables; by feeding them well, and treating them with care; by not employing them in labour, and not allowing them to go out for exercise, but in fine weather, their lives might be preserved, and we might even hope to see them produce. But such productions are rare and feeble; and the parents themselves are weak and languid. In these climates, therefore, they lose all their value, and, instead of being useful, they cost their owners much expense in the rearing. But, in their native country, they constitute the sole riches of their masters *. † The Arabians regard the camel as a present from heaven, a sacred animal ‡, without whose assistance they could neither subsist, carry on trade, nor travel. Camel's milk is the common food of the Arabians. They also eat its flesh, that of the young camel being reckoned highly savoury. Of the hair of those animals, which is fine and soft, and which is completely renewed every year ‡, the Arabians make

* Ex camelis Arabes divitias ac possessiones æstimant; et si quando de divitiis principis aut nobilis cujusdam sermo fiat, possidere aiunt tot camelorum, non aureorum, millia. — *Leon. Afric. Descript. Africa*, vol. ii. p. 748.

† Camelos, quibus Arabia maxime abundat, animalia sancta ii appellant, ex insigni commodo quod ex ipsis indigenæ accipiunt. — *Prosp. Alpin. Hist. Egypt.* part i. p. 225.

‡ In spring, the hair of the camel falls off so entirely, that he resembles a scalded hog. He is then smeared all over with pitch, to defend him from the flies. The hair of the camel is a fleece superior to that of any other domestic animal. In these countries, it is made into very fine stuffs, and, in Europe, hats are made of it by mixing it with beaver's hair. — *Voyage de Chardin*, tom. ii. p. 28. In the spring, the whole

stuffs for clothes, and other furniture. With their camels, they not only want nothing, but have nothing to fear*. In one day, they can perform a journey of fifty leagues into the desert, which cuts off every approach from their enemies. All the armies in the world would perish in pursuit of a troop of Arabs. Hence they never submit, unless from choice, to any power. Figure to yourselves a country without verdure and without water, a burning sun, an air always parched, sandy plains, mountains still more adust, which the eye runs over without perceiving a single animated being; a dead earth, perpetually tossed with the winds, and presenting nothing but bones, scattered flints, rocks perpendicular or overturned; a desert totally void, where the traveller never breathes under a shade, where nothing accompanies him, nothing recalls

hair falls from the camel in less than three days. The skin is completely naked, and then the flies become extremely troublesome, against which there is no other remedy but besmearing the whole body with pitch.—*Voyage de Tavernier*, tom. i. p. 162. Præter alia emolumenta quæ ex camelis capiunt, vestes quoque et tentoria ex iis habent; ex eorum enim pilis multa fiunt, maxime vero pannus, quo et principes oblectantur.—*Prosp. Alpin. Hist. Egypt.* part i. p. 226.

* The camels constitute the wealth, the safety, and the strength of the Arabs; for, by means of their camels, they carry all their effects into the deserts, where they have nothing to fear from the invasion of enemies.—*L'Afrique d'Ogilby*, p. 12. Qui porro camelos possident Arabes steriliter vivunt, ac libere, utpote cum quibus in desertis agere possint; ad quæ, propter ariditatem, nec reges, nec principes pervenire valent.—*Leon. Afric. Descript. Africa*, vol. ii. p. 749.

the idea of animated nature; absolute solitude, more dreadful than that of the deepest forests; for to man, trees are, at least, visible objects: more solitary and naked, more lost in an unlimited void, he every where beholds space surrounding him as a tomb: the light of the day, more dismal than the darkness of night, serves only to give him a clearer view of his own wretchedness and impotence, and to conceal from his view the barriers of the void, by extending around him that immense abyss, which separates him from the habitable parts of the earth; an abyss, which, in vain, he should attempt to traverse; for hunger, thirst, and scorching heat, haunt every moment that remains to him between despair and death.

The Arab, however, by the assistance of his camel, has learned to surmount, and even to appropriate, these frightful intervals of Nature. They serve him for an asylum, they secure his repose, and maintain his independence. But man never uses any thing without abuse. This same free, independent, tranquil, and even rich Arab, instead of regarding his deserts as the ramparts of his liberty, pollutes them with his crimes. He traverses them to carry off slaves and gold from the adjacent nations. He employs them for perpetrating his robberies, which unluckily he enjoys more than his liberty; for his enterprises are almost always successful. Notwithstanding the vigilance of his neighbours, and the superiority of their strength, he escapes their pursuit, and carries off, with impunity, all that he

ravages from them. An Arab, who give himself up to this kind of terrestrial piracy, is early accustomed to the fatigues of travelling, to want of sleep, and to endure hunger, thirst, and heat. With the same view, he instructs, rears, and exercises his camels. A few days after their birth*, he folds their limbs under their belly, forces them to remain on the ground, and, in this situation, loads them with a pretty heavy weight, which is never removed but for the purpose of replacing a greater. Instead of allowing them to feed at pleasure, and to drink when they are dry, he begins with regulating their meals, and makes them gradually travel long journeys, diminishing, at the same time, the quantity of their aliment. When they acquire some strength, they are trained to the course. He excites their emulation by the example of horses, and, in time renders them equally swift, and more robust †.

* The young camels, soon after birth, are obliged to lie on the ground, with their four legs folded under their belly, for fifteen or twenty days, in order to inure them to this posture. They never lie in another position. To learn them temperance and abstinence, they are then allowed very little milk; and, by this practice, they are trained to continue eight or ten days without drinking: and, as to victuals, it is astonishing that so large an animal should live on so small a quantity of food. — *Voyage de Chardin*, tom. ii. p. 28.

† The dromedary is particularly remarkable for swiftness. The Arabs say, that he can travel as far in one day as one of their best horses can do in eight or ten. The *Bekh*, who conducted us to Mount Sinai, was mounted on one of these camels, and often amused us with the great fleetness of the

In fine, after he is certain of the strength, fleetness, and sobriety of his camels, he loads them both with his own and their food, sets off with them, arrives unperceived at the confines of the desert, robs the first passengers he meets, pillages the solitary houses, loads his camels with the booty, and, if pursued, he is obliged to accelerate his retreat. It is on these occasions that he unfolds his own talents and those of the camels. He mounts one of the fleetest*, conducts the troop, and makes them travel night and day, without almost either stopping, eating, or drinking, and, in this manner, he easily performs a journey of three hundred leagues in eight days†.

animal on which he rode. He quitted our caravan to reconnoitre another, which was so distant that we could hardly perceive it, and returned to us in less than a quarter of an hour. — *Shaw's Travels*. A kind of camels are reared in Arabia for the purposes of the course. They trot so fleetly, that a horse cannot keep up with them, unless at a gallop. — *Voyage de Chardin*, tom. ii. p. 28.

* The dromedaries are so fleet, that they march thirty-five or forty leagues a day, and continue at this rate for eight or ten days through the desert, and eat extremely little. They are used by the Arabs of Numidia and the Lybian Africans as post horses, when a long journey is necessary; they likewise mount these animals in the time of combat. — *L'Afrique de Marmol*, tom. i. p. 49. The true dromedary is much lighter and swifter than the other camels; he can travel a hundred miles in a day, and continue at the same rate across the deserts, with a very little food, for seven or eight days. — *L'Afrique d'Ogilby*, p. 12.

† The dromedaries are smaller, more slender, and fleetier than the other camels, and are used only for carrying men. They have a fine soft trot, and easily accomplish forty leagues

During this period of motion and fatigue, his camels are perpetually loaded, and he allows them, each day, one hour only for repose, and a ball of paste. They often run in this manner nine or ten days without finding water*; and when, by chance, there is a pool at some distance, they scent the water half a league off†. Thirst makes them double their pace, and they drink as much at once as serves them for the time that is past, and as much to come; for their journeys

a day. The rider has only to keep a firm seat; and some people, for fear of falling, are tied on.—*Relation de Thevenot*, tom. i. p. 312.

* The camel can dispense with drinking during four or five days. A small quantity of beans and barley, or rather some morsels of paste made of flour, are sufficient for his daily nourishment. This fact I often experienced in my journey to Mount Sinai. Though each of our camels carried seven quintals, we travelled ten, and sometimes fifteen hours a day, at the rate of two and a half miles every hour.—*Shaw's Travels*. Adeo skim cameli tolerant, ut pota absque incommodo diebus quindecim abstinere possint. Nociturus alioquin si camelarius triduo absoluto equam illis porrigat, quod singulis quinis aut novenis diebus consueto more potentur vel urgente necessitate quindenis.—*Leon. Afric. Descript. Africa*, vol. ii. p. 749. The patience with which the camels suffer thirst is truly admirable. The last time I travelled the deserts, which the caravan did not clear in less than sixty-five days, our camels were once nine days without drink; because, during all this time, we found no water.—*Voyage de Tavernier*, tom. i. p. 162.

† We arrived at a hilly country: at the foot of the hills were large pools. Our camels, which had passed nine days without drink, smelled the water at the distance of half a league. They instantly begun their hard trot, which is their mode of running, and, entering the pools in troops, they first troubled the water, &c.—*Ibid.* p. 202.

often last several weeks, and their abstinence continues an equal time.

In Turkey, Persia, Arabia, Egypt, Barbary, &c., all the articles of merchandise are carried by camels*. Of all carriages, it is the cheapest and most expeditious. The merchants and other passengers unite in a caravan, to prevent the insults and robberies of the Arabs. These caravans are often very numerous, and are always composed of more camels than men. Each camel is loaded in proportion to his strength; and, when overloaded†, he refuses to march, and continues lying till his burden is lightened. The large camels generally carry a thousand, or even twelve hundred‡ pounds weight, and the

* The camels are very commodious for carrying baggage and merchandise at a small expense. . . . Their steps, as well as their journeys, are regulated. . . . Their food is cheap; for they live on thistles, nettles, &c. . . . They suffer drought two or three days.—*Voyage d'Olcarius*, tom. i. p. 552.

† When about to be loaded, at the command of their conductor, they instantly bend their knees. If any of them disobey, they are immediately struck with a stick; or their necks are pulled down; and then, as if constrained, and complaining in their own manner, they bend their knees, put their bellies on the earth, and remain in this posture till they are loaded and desired to rise. This is the origin of those large callosities on the parts of their bellies, limbs, and knees, which rest on the ground. If over-burdened, they give repeated blows with their heads to the person who oppresses them, and set up lamentable cries. Their ordinary load is double that which the strongest mule can carry.—*Voyage du P. Philippe*, p. 309.

‡ Some camels can carry loads of fifteen hundred pounds. But they are never burdened in this manner, unless when the

smallest from six to seven hundred *. In these commercial travels, their march is not hastened; as the route is often seven or eight hundred leagues, their motions and journeys are regulated. They walk only, and perform about from ten to twelve leagues each day. Every night they are unloaded and allowed to pasture at freedom. When in a rich country or fertile meadow, they eat, in less than an hour †, as much as serves them to ruminate the whole night, and to nourish them during twenty-four hours. But they seldom meet with such pastures; neither is this delicate food necessary for them. They even seem to prefer wormwood,

merchants approach the places where the imposts on goods are levied, which they mean partly to evade, by laying as much on one camel as was carried before by two. But, with this great load, they travel not above two or three leagues a day. — *Voyage de Tavernier*, tom. ii. p. 335.

* In the East, the camel is called a *land ship*, on account of the great load he carries, which, for large camels, is generally twelve or thirteen hundred pounds; for there are two kinds, *the northern* and *the southern*, as they are denominated by the Persians. The latter, who travel only from the Persic Gulf to Ispahan, are much smaller than the others, and carry only about seven hundred pounds; but they bring as much if not more profit to their masters, because their food hardly costs any thing. They march loaded in this manner, pasturing along the road, without bridle or halter. *Voyage de Chardin*, tom. ii. p. 27.

† *Victum cameli parcissimum, exiguique sumptus ferunt, et magnis laboribus robustissime resistunt. . . . Nullum animal illius molis citius comedit.* — *Prosp. Alpin. Hist. Egypt.* p. 225.

by this singular structure that the camel is enabled to pass several days without drinking, and to take at a time a prodigious quantity of water, which remains in the reservoir pure and limpid, because neither the liquors of the body, nor the juices of digestion, can mix with it.

If we reflect on the dissimilarities in this animal from other quadrupeds, we cannot doubt that his nature has been considerably changed by constraint, slavery, and perpetual labour. Of all animals, the camel is the most ancient, the completest, and the most laborious slave. He is the most ancient slave, because he inhabits those climates where men were first polished. He is the most complete slave, because, in the other species of domestic animals, as the horse, the dog, the ox, the sheep, the hog, &c., we still find individuals in a state of nature, and which have never submitted to men. But the whole species of the camel is enslaved; for none of them exist in their primitive state of liberty and independence. Lastly, he is the most laborious slave, because he has never been nourished for pomp, like most horses, nor for amusement, like most dogs, nor for the use of the table, like the ox, the hog, and the sheep; because he has always been made a beast of burden, whom men have never taken the trouble of yoking in machines, but have regarded the body of the animal as a living carriage which they may load, or overload, even during sleep; for, when hurried, the load is sometimes not taken off, but he lies down to

by this singular structure that the camel is enabled to pass several days without drinking, and to take at a time a prodigious quantity of water, which remains in the reservoir pure and limpid, because neither the liquor of the body, nor the juices of digestion, can mix with it.

If we reflect on the dissimilarities in this animal from other quadrupeds, we cannot doubt that his nature has been considerably changed by constraint, slavery, and perpetual labour. Of all animals, the camel is the most ancient, the completest, and the most laborious slave. He is the most ancient slave, because he inhabits those climates where men were first polished. He is the most complete slave, because, in the other species of domestic animals, as the horse, the dog, the ox, the sheep, the hog, &c., we still find individuals in a state of nature, and which have never submitted to men. But the whole species of the camel is enslaved; for none of them exist in their primitive state of liberty and independence. Lastly, he is the most laborious slave, because he has never been nourished for pomp, like most horses, nor for amusement, like most dogs, nor for the use of the table, like the ox, the hog, and the sheep, because he has always been made a beast of burden, whom men have never taken the trouble of yoking in machines, but have regarded the body of the animal as a living carriage which they may load, or overload even during sleep, for, when hurried, the load is sometimes not taken off, but he lies down to

sleep under it ; with his legs folded *, and his body resting on his stomach. Hence these animals perpetually bear the marks of servitude and pain. Upon the under part of the breast, there is a large callosity as hard as horn, and similar ones on the joints of the limbs. Though these callosities are found on all camels, they exhibit a proof that they are not natural, but produced by excessive constraint and painful labour ; for they are often filled with pus †. The breast and legs, therefore, are deformed by callosities ; the back is still more disfigured by one or two bunches. The callosities, as well as the bunches, are perpetuated by generation. As it is obvious, that the first deformity proceeds from the constant practice of forcing these animals, from their earliest age ‡, to lie on their stomach, with their limbs folded under the body, and, in this situation, to

* In the night, the camels sleep on their knees, and ruminate what they have eaten during the day. — *Voyage du P. Philippe*, p. 269.

† Having opened the callosities on the legs to examine their structure, which is a medium between fat and ligament, we found, in a small camel, that some of them contained a collection of thick pus. The callosity on the sternum was eight inches long, six broad, and two thick. In it likewise we found a great deal of pus. — *Mém. pour servir à l'Hist. des Animaux*, part i. p. 74.

‡ As soon as the camel is brought forth, his four legs are folded under his body. After which, he is covered with a cloth, which hangs down to the ground, and on the borders of which a quantity of stones are laid, to prevent him from rising, and in this position he remains fifteen or twenty days.

bear both the weight of their own bodies, and that of the loads laid on their backs; we ought to presume that the bunch or bunches have also originated from the unequal pressure of heavy burdens, which would naturally make the flesh, the fat, and the skin, swell; for these bunches are not osseous, but composed of a fleshy substance, similar to that of a cow's udder*. Hence the callosities and bunches should be equally regarded as deformities produced by continual labour and bodily constraint; and, though at first accidental and individual, they are now become permanent and common to the whole species. We may likewise presume, that the bag which contains the water, and is only an appendix to the paunch, has been produced by an unnatural extension of this viscus. The animal, after suffering thirst for a long time, by taking at once as much, and perhaps more water than the stomach could easily contain, this membrane would be gradually extended and dilated; in the same manner as we have seen the stomach of a sheep extend in proportion to the quantity of its aliment. In sheep fed with grain, the stomach is very small; but becomes very large in those fed with herbage alone.

These conjectures would be either fully con-

He is served with milk, but very sparingly, in order to accustom him to drink little. — *Voyage de Tavernier*, tom. i. p. 161.

* The flesh of the camel is insipid, especially that of the bunch, the taste of which resembles that of a fat cow's udder. — *L'Afrique de Marmel*, tom. i. p. 50.

firmed or destroyed, if we had wild camels to compare with the domestic. But these animals no where exist in a natural state, or, if they do, no man has observed or described them. We ought to suppose, therefore, that every thing good and beautiful belongs to Nature, and that whatever is defective and deformed in these animals proceeds from the labour and slavery imposed on them by the empire of man. These inoffensive creatures must suffer much; for they utter the most lamentable cries, especially when overloaded. But, though perpetually oppressed, their fortitude is equal to their docility. At the first signal *, they bend their knees and lie down to be loaded †, which saves their conductor the

* The camels are so obedient to their masters, that, when he wants to load or unload them, by a single word or signal, they instantly lie down on their bellies. Their food is scanty, and their labour great. — *Cosmog. du Levant, par Thuret*, p. 74. They are accustomed to lie down to be loaded, by having their legs folded under them when very young; and their obedience is so prompt as to excite admiration. Whenever the caravan arrives at the place of encampment, all the camels which belong to one master range themselves spontaneously in a circular form, and lie down on their four legs; so that, by loosing a cord which binds the bales, they gently fall down on each side of the animal. When the time of loading arrives, the camels come and lie down between the bales, and after they are fixed, rise softly with their load. This exercise they perform in a short time, and without the smallest trouble or noise. — *Voyage de Tavernier*, tom. i. p. 160.

† The camels, when about to be loaded, lie down on their four legs, and then rise with their burden. — *Voyage de la*

trouble of raising the goods to a great height. As soon as they are loaded, they rise spontaneously, and without any assistance. One of them is mounted by their conductor, who goes before, and regulates the march of all the followers. They require neither whip nor spur. But, when they begin to be tired, their courage is supported, or rather their fatigue is charmed, by singing, or by the sound of some instrument *. Their conductors relieve each other in singing; and, when they want to prolong the journey †, they give

Boulaie-le-Grouz, p. 255. The camels lie down to be loaded or unloaded, and rise when desired. — *Relation de Therenot*, tom. i. p. 312.

* The camels rejoice at the harmonious sound of the voice, or of some instrument. . . . The Arabs use timbrels, because whipping does not make the animals advance. But music, and particularly that of the human voice, animates and gives them courage. — *Voyage d'Olearius*, tom. i. p. 552. When their conductor wants to make his camels perform extraordinary journeys, instead of chastising, he encourages them with a song; and, though they had formerly stopt, and refused to proceed farther, they now go on cheerfully, and quicker than a horse when pushed with the spur. — *L'Afrique de Marmol*, tom. i. p. 47. The master conducts his camels by singing, and, from time to time, blowing his whistle. The more he sings, and the louder he blows, the animals march the quicker; and, when he ceases to sing, they stop. Their conductors relieve each other by singing alternately, &c. — *Voyage de Tavernier*, tom. i. p. 163.

† It is remarkable, that the camels learn to march by a kind of singing; for they proceed quickly or slowly, according to the sound of the voice. In the same manner, when their masters want an extraordinary journey performed, they know the tunes which the animals love best to hear. — *Voyage de Chardin*, tom. ii. p. 28.

the animals but one hour's rest; after which, resuming their song, they proceed on their march for several hours more, and the singing is continued till they arrive at another resting place, when the camels again lie down; and their loads, by unloosing the ropes, are allowed to glide off on each side of the animals. Thus they sleep on their bellies in the middle of their baggage, which, next morning, is fixed on their backs with equal quickness and facility as it had been detached the evening before.

The callosities and tumours on the breast and legs; the contusions and wounds of the skin, the complete falling off of the hair, hunger, thirst, and meagerness, are not the only inconveniences to which these animals are subjected: to suffer all these evils, they are prepared by castration, which is a misfortune greater than any other they are obliged to undergo. One male is only left for eight or ten females *; and the labouring camels are generally geldings. They are unquestionably weaker than un mutilated males: but they are more tractable, and at all seasons ready for service. While the former are not only unmanageable, but almost furious †, during the rut-

* The Africans geld all their camels which are destined to carry burdens, and only one entire male is left for ten females. — *L'Afrique de Marmol*, tom. i. p. 48.

† In the rutting season, the camels are extremely troublesome. They fret and foam, and bite every person who approaches them, and for that reason they are muzzled. — *Relation de Thénart*, tom. i. p. 222. When the camels are in season, those who have the charge of them are obliged to

ting season, which lasts forty days*, and returns annually in the spring†. It is then said, that they foam continually, and that one or two red vesicles, as large as a hog's bladder, issue from their mouths‡. In this season, they eat little, attack and bite animals, and even their own mas-

muzzle them, and to be much on their guard; for the animals are mischievous, and even furious.—*Voyage de Jean Ovington*, tom. i. p. 222.

* The camels, in the season of love, are dangerous. This season continues forty days, and, when past, they resume their ordinary mildness.—*L'Afrique de Marmol*, tom. i. p. 49.

† The male camels, which, in all other seasons, are extremely gentle and tractable, become furious in the spring, which is the time of their copulating. Like the cats, the camels generally perform this operation during the night. The sheath of their penis then lengthens, as happens to all animals which lie much on their bellies. At all other times, it is more contracted and inclined backward, that they may discharge their urine with more ease.—*Shaw's Travels*. In the month of February, the camels come in season, and the males are so furious that they foam incessantly at the mouth.—*Voyage de la Boulaie-le-Gour*, p. 256.

‡ When the camel is in season, he continues forty days without eating or drinking; and he is then so furious, that, unless prevented, he bites every person who comes near him. Wherever he bites, he carries off the piece; and from his mouth there issues a white foam, accompanied with two bladders, which are large, and blown up like the bladder of a hog.—*Voyage de Tavernier*, tom. i. p. 161. The camels, when in season, live forty-two days without food.—*Relat. de Thevenot*, tom. ii. p. 222. "Veneris furorē diebus quadraginta permanent saeviſ patientes."—*Leon. Afric.* vol. ii. p. 748. In the rutting season, which lasts five or six weeks, the camel eats much less than at any other time.—*Voyage de Chardin*, tom. ii. p. 28.

ters, to whom, at all other times, they are very submissive. Their mode of copulating differs from that of all other quadrupeds; for the female, instead of standing, lies down on her knees, and receives the male in the same position that she reposes, or is loaded*. This posture, to which the animals are early accustomed, becomes natural, since they assume it spontaneously in coition. The time of gestation is near twelve months†, and, like all large quadrupeds, the females bring forth only one at a birth. Her milk is copious and thick; and when mixed with a large quantity of water, affords an excellent nourishment to men. The females are not obliged to labour, but are allowed to pasture and produce at full liberty‡. The advantages derived

* When the camels copulate, the female lies down in the same manner as when she is about to be loaded. Some of them go thirteen months with young,—*Relation de Thevenot*, tom. ii. p. 23. The female receives the male lying on her belly.—*Voyage de Jean Ovington*, p. 223. It is remarkable, that, when these animals copulate, the females lie on their bellies in the same manner as when they are loading. The time of their gestation is from eleven to twelve months.—*Voyage de Chardin*, tom. ii. p. 28. It is true, that the females go with young twelve months: but those who assert, that, during the time of coition, the male turns his crupper to the female, are deceived. This error proceeds from the circumstance of his discharging his urine backward, by placing the penis between the two hind legs. But, in copulating, the female lies on her belly, and receives the male in that position.—*Voyage de Olearius*, tom. i. p. 553.

† The females go with young near twelve months, or from one spring to the following.—*Shaw's Travels*.

‡ *Cámelos feminas intactas propter eorum lac servant, eis*

from their produce and their milk*, are perhaps superior to what could be drawn from their work. In some places, however, most of the females are castrated†, in order to fit them for labour; and it is alleged, that this operation, instead of diminishing, augments their strength, vigour, and plumpness. In general, the fatter camels are, they are the more capable of enduring great fatigue. Their bunches seem to proceed from a redundance of nourishment; for, during long journeys, in which their conductor is obliged to husband their food, and where they often suffer much hunger and thirst, these bunches gradually diminish, and become so flat, that the place where they were is only perceptible by the length of the hair, which is always longer on these parts than on the rest of the back. The meagerness of the body augments in proportion as the bunches decrease. The Moors, who transport all articles of merchandise from Barbary and Numidia, as far as Æthiopia, set out with their camels well laden, and when they are very fat and vigorous‡; and bring back the same ani-

omni labore solutas vogari, permittentes per loca sylvestria pascentes, &c. — *Prosp. Alpin. Hist. Ægypt.* part i. p. 226.

* Of the camel's milk, small cheeses are made, which are very dear, and highly esteemed among the Arabs. — *Voyage du P. Philippe*, p. 370.

† The males are castrated; and the females sometimes undergo a similar operation, which renders them stronger and larger. — *Wotton*, p. 82.

‡ When the camels begin their journey, it is necessary that they should be fat; for, when this animal has travelled forty or fifty days without having barley to eat, the fat of

mal so meager, that they commonly sell at a low price to the Arabs of the desert, to be again fattened.

We are told by the ancients, that camels are in a condition for propagating at the age of three years*. This assertion is suspicious; for, in three years, they have not acquired one half of their growth†. The penis of the male, like that of the bull, is very long, and very slender‡. During erection it stretches forward, like that of all other quadrupeds; but, in its ordinary state, the sheath is drawn backward, and the urine is discharged from between the hind-legs§; so

the bunches begins to diminish, then that of the belly, and, lastly, that of the limbs; after which he is no longer able to carry his load. . . . The caravans of Africa, which travel to Æthiopia, never think of bringing back their camels; because they transport no heavy goods from that country; and, when they arrive, they sell their meager animals.—*L'Afrique de Marmol*, tom. i. p. 49. Camelos macilentos, dorsique vulneribus saucios, vili pretio Desertorum incolis saginandos divendunt.—*Leon. Afric. Descript. Africa*, vol. ii. p. 479.

* Incipit mas et femina coire in trimatu.—*Arist. Hist. Anim.* lib. v. cap. 14.

† In the year 1752, we saw a female camel of three years of age. . . . She had not acquired above one half of her stature.—*Hist. Nat. des Animaux, par Mess. Arnauld de Noleville et Salerne*, tom. iv. p. 126, 130.

‡ Though the camel is a large animal, his penis, which is at least three feet long, is not thicker than the little finger of a man.—*Voyage d'Olearius*, tom. i. p. 554.

§ The camels discharge their urine backward. Persons unacquainted with this circumstance, are liable to have their clothes soiled with urine.—*Connographie du Levant, par Thevet*, p. 74. The camel discharges his urine backward.—*Voyage de Villamont*, p. 688.

that both males and females urinate in the same manner. The young camel sucks his mother twelve months *; but, when designed to be trained, in order to render him strong and robust in the chase, he is allowed to suck and pasture at freedom during the first years, and is not loaded, or made to perform any labour, till he is four years of age †. He generally lives forty, and sometimes fifty years ‡, and the duration of his life is thus proportioned to the time of his growth. There is no foundation for what has been advanced by some authors, that he lives 100 years.

Having little to add to what has been said with regard to the camel and dromedary, we shall content ourselves with quoting a passage from M. Niebuhr's Description of Arabia, p. 141.

“ In the country of Iman most of the camels are of a middle stature, and of a bright brown colour; some of them, however, are large, heavy, and of a deep brown colour. When about to copulate, the female lies down on her legs; and her fore-legs are tied, to prevent her from rising. The male sits on his posteriors like a dog; with his two fore-feet resting on the ground. He seems to be colder and more indifferent than any

* *Separant prolem a parente anniculant.* — *Arist. Hist. Anim.* lib. vi. cap. 26.

† The camels called *hagin* by the Africans, are the largest; but they are never loaded till they are four years old. — *L'Afrique de Marmat*, tom. j. p. 48.

‡ *Camelus vivit diu, plus enim quam quadraginta annos.* — *Arist. Hist. Anim.* lib. vi. cap. 26.

other animal; for he often requires to be teased a long time before the ardour of love is excited. When the operation is finished, the female is suddenly raised and forced to walk. The same thing, it is said, takes place in Mesopotamia, Natolia, and probably every where else."

I remarked, that camels had been transported to the Canaries, Antilles, and Peru; but that they had not succeeded in any part of the New World. Dr. Brown, in his History of Jamaica, affirms, that he saw dromedaries there, which the English, in former times, had transported thither in great numbers, and that, though they still subsist, they are of little use; because the inhabitants are ignorant of the proper manner of feeding and treating these animals. They, however, multiply in all these climates. and I doubt not but they might produce even in France. We see from the Gazette of June 9, 1775, that M. Brinkenof having made a male and female camel copulate in his territories near Berlin, obtained, on the 24th day of March, 1775, after a period of twelve months, a young camel, which was healthy and vigorous. This fact confirms what I said concerning the production of dromedaries and camels at Dresden; and I am persuaded, that, if we had Arabian servants, who know how to manage these animals, we might soon render this species domestic; which I consider as the most useful of all quadrupeds.

By considering, under one point of view, all the qualities of this animal, and all the advantages derived from him, it must be acknowledged

that he is the most useful creature which was ever subjected to the service of man. Gold and silk constitute not the true riches of the East. The camel is the genuine treasure of Asia. He is more valuable than the elephant; for he may be said to perform an equal quantity of labour at a twentieth part of the expense. * Besides, the whole species are subjected to man, who propagates and multiplies them at pleasure. But he has no such dominion over the elephants, whom he cannot multiply, and the individuals of which he conquers with great labour and difficulty. The camel is not only more valuable than the elephant, but he is perhaps equal in utility to the horse, the ass, and the ox, when their powers are united. He carries as much as two mules, though he eats as little, and feeds upon herbs equally coarse as the ass. The female furnishes milk longer than the cow *. The flesh of young camels is as good and wholesome † as veal. Their hair is finer ‡ and more in request than the

* Parit in vere, et lac suum usque eo servat quo jam conceperit. — *Arist. Hist. Anim.* lib. vi. cap. 26. Fœmina post partum interposito anno coit. — *Id.* lib. v. cap. 14.

† The Africans and Arabs fill their pots and tubs with camels' flesh, which is fried with grease, and preserved in this manner during the whole year for their ordinary repasts. — *L'Afrique du Marmol*, tom. i. p. 50. — Præter alia animalia quorum carnem in cibo plurimi faciunt, cameli in magno honore existunt; in Arabum principum castris cameli plures unius anni aut biennes inactantur, quorum carnes avide comedunt, easque odoratas, suaves, atque optimas esse fatentur. — *Prosp. Alpin. Hist. Egypt.* part i. p. 226.

‡ Socks are made of the camel's hair; and, in Persia, fine girdles are made of it; some of which, especially when white,

best wool. . Even their excrements are useful; for sal ammoniac is made of their urine, and their dung serves for litter * to themselves, as well as to horses, with which people frequently travel † in countries where no hay or straw can be had. In fine, their dung makes excellent fuel. It burns freely ‡, gives as clear and nearly as hot a flame as dry wood, and is of great use in the deserts, where not a tree is to be found, and where, for want of combustible materials, fire is as scarce as water § ||.

cost two *tomans*, because camels of this colour are rare. — *Relation de Thérénot*, tom. ii. p. 223.

* Their own dung serves them for litter: For this purpose it is exposed to the sun during the day, which dries it so completely, that it crumbles down into a kind of powder, which is carefully spread for litter. — *Relation de Thérénot*, p. 73.

† The ancients tell us, without any foundation, that the camels have a great antipathy to horses. I could not learn, says Olearius, why Pliny, after Xenophon, should advance that camels have an aversion to horses. When I mentioned it to the Persians, they laughed at me. . . . There is hardly a caravan in which there are not camels, horses, and asses, all lodged promiscuously together, without discovering the smallest aversion or animosity against each other. — *Voyage d'Olearius*, tom. i. p. 533.

‡ The camels' dung left by some caravans, which had gone before us, generally served us for fuel; after being exposed a day or two to the sun, it is easily inflamed, and burns as clear and with as strong a heat as dried wood or charcoal. — *Shaw's Travels*.

§ Hist. Nat. des Animaux, par Mess. Arnauld de Nobleville et Salerne, tom. iv. p. 313.

|| Pallas, speaking of the animals of the Crimea, says, that the Tauridan camel has two bunches, and attains to a larger size

than among the Kalmuc Tartars. They are seldom used as beasts of burden, but are often yoked to the large four-wheeled waggons, or *Madshari*, especially on bad roads, and during winter. From the hair of this quadruped, the Tartar women manufacture a narrow cloth, which is used in its natural colour, and is extremely warm, soft, and light. The mild winter of the Crimea is very favourable to the habits and propagation of camels; and these quadrupeds are more numerous than is commonly supposed. In the year 1796, a thousand camels were bought in Crim-Tartary for the use of the army in Persia; and they were procured in the course of a few weeks, without any remarkable diminution of their number. The price of a full grown camel is generally from one hundred to one hundred and fifty rubles.

W.

THE BUFFALO *, THE BONASUS †, THE URUS, THE BISON, AND THE ZEBU.

THE buffalo, though now common in Greece, and domestic in Italy, was unknown both to the ancient Greeks and Romans; for he has

* CHARACTER SPECIFICUS †.

BOS BUBALUS. B. cornibus resupinatis intortis, antice planis. — *Linn. Syst. Nat. Gmel.* i. p. 206. — *Erxleb. Mus.* p. 238.

Bos (bubalus) cornibus compressis, sursum reflexis, resupinatis, fronte crispa. — *Briss. Quadr.* p. 81.

BOS INDICUS. — *Plin. Hist. Nat.* viii. c. 45.

BUBALUS. — *Gesn. Quadr.* p. 139, fig. mala. — *Jonst. Quadr.* pl. 20. fig. bona. — *Ray's Synops. Quadr.* p. 72.

BUFFELOCHSEN. — *Kolbe Vogel.* p. 143, pl. 5. fig. 2, bona.

LE BUFFLE. — *Buff. Hist. Nat. par Sonn.* xxix. p. 68, pl. 3.

BUFFALO. — *Penn. Hist. Quadr.* i. p. 28. — *Bew. Quadr.* p. 43. — *Shaw's Gen. Zool.* i. p. 401. — *Wood's Zoography.* i. p. 19, pl. 1.

HABITAT

in Asia, cultus in variis ejus Africæque provinciis, nec non in Húngaria et Italia.

‡ For the generic character, see Ox.



BUFFALO.

no name in the languages of these people. Even the word *buffalo* indicates a foreign origin; for it has no root, either in Greek or

The Bonasus, the Ursus, the Bison, and the Zebu, are considered as varieties only of the *Bos Taurus*, and are arranged accordingly by Gmelin in the 13th edition of the *Systema Naturæ*. W.

This animal has no name either in Greek or Latin. In modern Latin, *Bubalus*, *Buffeius*; in Italian, *Bufalo*; in German, *Buffel*; at Congo, according to Dapper, *Empakassa*, or *Pakassa*; and at the Cape of Good Hope, according to Kolbe, *Gu Aroho*:

† Bonasus quoque e sylvestribus cornigeris enumerandus est.—*Arist. Hist. Anim.* lib. ii. cap. i. . . . Sunt nonnulla quæ simul biscula sunt, et júbam habeant et cornua bina, orbem inflexu mutuo colligentia, gerant, ut bonasus, qui in Pœonia terra et Mediâ gignitur. — *Id. ibid.* . . . Bonasus etiam interiora omnia bubus similia continet.—*Idem.* lib. ii. cap. 101. : . . Bonasus gignitur in terra Pœonia, monte Messapio, qui Pœoniæ, et Mediæ terræ collimitium est, et Monapios a Pœonibus appellatur, magnitudine tauri, sed corpore quam bos latiore: brevior enim et in latera auctior est. Tergus distentum ejus locum septem accubantium occupat; cætera, forma bovis similis est, nisi quod cervix jabata armorum tenus ut equi est, sed villo molliore quam juba equina et compositiore; color pili totius corporis flavus, juba proluxa et ad oculos usque demissa et frequenti colori inter cinereum et rufum, non qualis equorum, quos partes vocant, est, sed villo supra squalidiore, subter lanario. Nigri aut admodum rufi nati sunt. Vocem similes bovi emittunt; cornua adunca in se flexa et pugnae inutiles gerunt, magnitudine palmari, aut paulo majora, amplitudine non multo arctiore quam ut singula semi-sextarium capiant nigritie proba. Antiæ ad oculos usque demissæ, ita ut in latus potius quam ante pendeant. Caret superiore dentium ordine, ut bos et reliqua cornigera omnia. Crura hirsuta atque bisulca habet; caudam minorem quam pro sui corporis magnitudine, similem bubulæ. Excitat pulverem et

Latin. In a word, this animal is a native of the warm regions of Africa and the Indies, and was not transported and naturalized in Italy, till about the seventh century. The moderns have improperly applied to him the name *bubalus*, which, indeed, denotes an African animal, but very different from the buffalo, as might be shown from many passages of ancient authors. If the *bubalus* were to be referred to a particular genus, he should rather belong to that of the antelope, than to that of the ox. Belon having seen at Cairo a small ox with a bunch on its back, which differed from the buffalo and common ox, imagined that it might be the *bubalus* of the ancients. But, if he had carefully compared the characters given by the ancients to the *bubalus*, with those of this small ox, he would have discovered his error. Besides, we are enabled to speak of it with certainty; for we have seen it alive; and, after comparing the description we have given of it with that of Belon, we cannot hesitate in pronouncing it to be the same animal. It was ex-

fedit, ut taurus. Tergore contra ictus prævalido est. Carnem habet gustu suavem: quamobrem in usu venandi est. Cum percussus est, fugit, nisi defatigatus nusquam consistit. Repognat calcitrans et proluvium alvi vel ad quatuor passus projiciens, quo præsidio facile utitur, et plerumque ita adurit, ut pili insectantium canum absumantur. Sed tunc ea vis est in simo, cum bellua excitata et metuit: nam si quiescit, nihil urere protest. Talis natura et species ejus animalis est. Tempore pariendi universi, in montibus enituntur; sed priusquam fœtum edant, excremento alvi circiter eum locum in quo pariunt, se quasi vallo circumdant et muniunt, largam enim quandam ejus excrementi copiam hæc bellua egerit. — *Idem.* lib. ix. cap. 45.—*Traduction de Theodore Gazu.*

hibited at the fair of Paris in the year 1752, under the name of *zebu*, which we have adopted to denote this animal, because it is a particular race of the ox, and not a species of the buffalo or bubalus.

Aristotle, when treating of oxen, mentions not the common ox, but only remarks, that, among the *arachotas* in India, there are wild oxen, which differ from the domestic kind as much as the wild boar differs from the common hog. But, in another place, as quoted above in the notes, he gives a description of a wild ox in Pœonia, a province bordering on Macedonia, which he calls *bonasus*. Thus the common ox and the bonasus are the only animals of this kind mentioned by Aristotle; and, what is singular, the bonasus, though fully described by this great philosopher, was unknown to the Greek and Latin naturalists who wrote after him; for they have all copied him verbatim on this subject: so that, at present, we only know the name *bonasus*, without being able to distinguish the animal to which it ought to be applied. If we consider, however, that Aristotle, when speaking of the wild oxen of temperate climates, mentions the bonasus only, and that, on the contrary, the Greeks and Latins of after-ages take no notice of the bonasus, but point out these wild oxen under the appellations of *urus* and *bison*, we will be induced to think that the bonasus must be either the one or the other of these animals; and, indeed, by comparing what Aristotle has said of the bonasus, with what we know concerning the

bison, it is probable that these two names denote the same animal. The *urus* is first mentioned by Julius Cæsar; Pliny and Pausanias are also the first who announced the bison. From the time of Pliny, the name *bubalus* has been indiscriminately applied to the *urus* or the bison. Confusion always augments as time advances. To the *bonasus*, *bubalus*, *urus*, and bison, have been added the *catobleba*, the *thur*, the *bubalus* of Belon, the Scottish and American bisons; and all our naturalists have made as many different species as they have found names. Here truth is so environed with darkness and error, that it will be difficult to elucidate this part of natural history, which the contrariety of evidence, the variety of descriptions, the multiplicity of denominations, the diversity of places, the differences of languages, and the obscurity of time, seemed to have condemned to perpetual darkness.

I shall first give my opinion on this subject, and afterwards produce the proofs of it.

1. The animal we call *buffalo* was unknown to the ancients.

2. The buffalo, now domestic in Europe, is the same as the domestic or wild buffalo of India and Africa.

3. The *bubalus* of the Greeks and Romans is neither the buffalo nor the small ox of Belon, but the animal described in the *Memoires* of the *Barbary* cow, and which we call *bubalus*.

4. The small ox of Belon, which we have seen, and distinguished by the name *sebu*, is only a variety of the common ox.

5. The *bonasus* of Aristotle is the same animal with the bison of the Latins.

6. The *bison* of America might proceed originally from the European bison.

7. The *urus*, or *aurochs*, is the same animal with the common bull in its natural and wild state.

8. The bison differs from the aurochs by accidental varieties only; and, consequently, it is, as well as the aurochs, of the same species with the domestic ox; so that I think I shall be able to reduce all the denominations, and all the pretended species both of ancient and modern naturalists, to three, namely, the ox, the buffalo, and the bubalus.

Some of the propositions I am about to lay down, will, I doubt not, appear to be mere assertions, particularly to those who have been accustomed to study the nomenclatures of animals, or have attempted to give lists of them. There are none of these assertions, however, which I am not able to prove. But, before entering into critical discussions, each of which requires particular propositions, I shall relate the facts and remarks which led me into this research; and as they have satisfied myself, I hope they will be equally satisfactory to others.

Domestic animals differ, in many respects, from wild animals. Their nature, their size, and their form, are more fluctuating, and subject to greater changes, especially in the external parts of the body. The influence of climate, which acts powerfully upon all Nature, exerts itself

with greater efficacy upon captive than upon free animals. Food prepared by the hand of man, which is often ill chosen, and sparingly administered, joined to the inclemency of a foreign sky, produce, in the progress of time, alterations so deeply engraven, that they become constant, and are transmitted to posterity. I pretend not to maintain, that this general cause of change is so powerful as to alter essentially the nature of beings, whose constitution is so permanently fixed as that of animals. But it transforms and masks their external appearance; it annihilates some parts, and gives rise to others; it paints them with various colours; and, by its action on the temperament of the body, it has an influence on the dispositions, instincts, and other internal qualities. The modification of a single part, in a machine so perfect as that of an animal body, is sufficient to make the whole feel the effects of the alteration. It is for this reason that our domestic animals differ nearly as much in dispositions and instincts, as in figure, from those which enjoy their natural state of freedom. Of this the sheep affords a striking example. This species, in its present condition, could not exist without the care and defence of man; it is also much changed, and very inferior to its original species. But, not to depart from our chief object, we see how many alterations the ox has undergone, from the combined effects of climate, food, and management, in a wild, and in a domestic state.

The bunch which some oxen carry between

their shoulders, both in a domestic and wild state, is the most general and most remarkable variety. This race of oxen are denominated *bisons*; and, it has been imagined, till now, that they were of a different species from the common ox. But, as we are certain that these animals produce with the common kind, and that the bunch diminishes from the first generation, and disappears in the second or third, it is evident, that this bunch is only an accidental and variable character, which prevents not the bunched ox from belonging to the same species with our ox. Now, in the desert parts of Europe, there were, in ancient times, wild oxen, some of them with bunches, and others without bunches. Hence this variety seems to be natural, and to proceed from the abundance and more substantial quality of the food; for we remarked, when treating of the camels, that, when meager and ill fed, they have not even the least vestige of a bunch. The ox without a bunch was called *vrochs* and *tu-rochs* in the language of the Germans, and, in the same language, the bunched ox was called *visen*. The Romans, who knew neither of these wild oxen till they saw them in Germany, adopted their German names. From *vrochs* they made *vrus*, and from *visen*, *bison*. They never imagined that the wild ox described by Aristotle, under the name of *bonasus*, could be one or other of these oxen, whose names they had Latinized.

The length of the hair is another difference between the aurochs and bison. The neck, the

shoulders, and the throat of the bison, are covered with very long hair. But, in the aurochs, all these parts are covered with short hair, similar to that on the rest of the body, except the front, which is covered with crisped hair. This difference of the hair, however, is still more accidental than that of the bunch, and depends likewise on the food and the climate, as we have proved under the articles Goat, Sheep, Dog, Cat, Rabbit, &c. Thus, neither the bunch, nor the difference in the length of the hair, are specific characters, but accidental varieties only.

A more extensive variety than the other two arises from the figure of the horns; to which character naturalists have ascribed more importance than it deserves. They have not considered, that, in our domestic cattle, the figure, the size, the position, the direction, and even the number of the horns, vary so greatly, that it is impossible to ascertain what is the real model of Nature. In some cows, the horns are very crooked, and hang so low, as to be almost pendulous; in others, they are more erect, longer, and more elevated. There are entire races of ewes with sometimes two, sometimes four horns; and there are races of cows without horns. These external, or, as they may be called, accessory parts of the body, are as fluctuating as the colours of the hair, which, in domestic animals, are varied and combined in every possible manner. This difference in the figure and direction of the horns, which is so frequent, ought not, therefore, to be regarded as a distinctive character

of species. It is, however, the only character which our naturalists have adopted in their species; and, as Aristotle, in his description of the bonasus, says, that its horns bended inwards, they have, from this consideration alone, and without having ever seen the individual, separated it from the rest, and made it a distinct species. In this variation of the horns of domestic animals, we have confined our remarks to cows and ewes; because the females are always more numerous than the males; and we every where see thirty cows or ewes for one bull or ram.

The mutilation of animals by castration seems to injure the individual only, and to have no influence on the species. It is certain, however, that this practice restrains Nature on the one hand, and weakens her on the other. A single male, obliged to serve thirty or forty females, must be enfeebled; besides, the ardour of love is unequal. It is cool in the male, who exerts himself beyond the bounds of Nature, and too ardent in the female, whose enjoyment is limited to an instant. Of course, the offspring must be chiefly tinged with the feminine qualities; more females will be produced than males; and even the males will partake more of the mother than the father. This is unquestionably the reason why more girls than boys are brought forth in those countries where the men have a great number of wives *. On the contrary, in

* This observation may be generally applied with a great degree of truth. I have reason to believe that, in this coun-

all countries where the men are allowed but one wife, more males are produced than females. It is true, that, in domestic animals, the finest males are selected to become the fathers of an offspring so numerous. The first productions from these males will be strong and vigorous. But, in proportion to the number of copies taken from the same mould, the original impression of Nature will be deformed, or at least rendered less perfect. The race must therefore degenerate, and become more feeble. This, perhaps, is the reason why more monsters are produced among domestic than wild animals, where the number of males is equal to that of the females. Besides, when one male is obliged to serve many females, they have not the liberty of following their own taste. They are deprived of that gaiety, and those soft emotions which proceed from spontaneous pleasures. The fire of their love is half extinguished; and they languish, waiting for the cold approaches of a male whom they have not selected, who is often not accommodated to them, and who always flatters less than one that is obliged to caress, in order to obtain a preference. These melancholy and tasteless amours must give rise to productions equally dismal and insipid; beings who never have that courage, spirit, and strength, which Nature can only bestow on each species, by leaving all the individuals in full possession of their powers, and,

try, families are considerably influenced, as far as respects the proportion of males to females, by the conduct of the men before marriage.

W.

above all, of the liberty of choice in the intermixture of the sexes. We learn from the example of horses, that crossed races are always the most beautiful. We ought not, therefore, to confine our female cattle to a single male of their own country, who already has too much resemblance to his mother, and who, consequently, instead of improving, continues to degrade the species. Man, in this article, prefers his convenience to every other advantage. We never think of improving or of embellishing Nature; but we submit to her operations, that we may enjoy her in a more arbitrary manner. The males constitute the glory of each species. They have more courage, fire, and obstinacy. A great number of males in our flocks would render them less tractable, and more difficult to manage. In those slaves of the most abject kind, it is even necessary to depress every head that offers to exalt itself.

To these causes of degeneration in domestic animals, we must still add another, which alone has produced more changes than all the combined force of the others; I mean, the constant transportation of those animals from climate to climate. The ox, the sheep, the goat, have been carried to every habitable part of the globe. These species have been subjected to the influence of every climate, and have received impressions from every soil and every sky; so that it has become extremely difficult, amidst the number of changes they have undergone, to recognise

those which are least removed from the prototype of Nature.

Having pointed out the general causes of the varieties among domestic animals, I shall now exhibit the particular proofs of what I advanced concerning the oxen and buffaloes.

1. I remarked, that the animal we now know by the name of buffalo, was unknown to the ancient Greeks and Romans. This position is evident; for in none of their authors is there any description, or even name, which can be applied to the buffalo. Besides, we learn from the annals of Italy, that the first buffalo was transported thither about the end of the sixth century*.

2. The buffalo, now domestic in Europe, is the same with the wild or domestic buffalo of India and Africa. Of this no other proof is necessary than a comparison of our description of the buffalo, which was made from the live animal, with the notices given by travellers of the buffaloes in Persia †, Mogul ‡, Bengal §, Egypt ||, Guinea ¶, and the Cape of Good Hope **. It is easy to perceive, that, in all these countries, this animal is the same, and

* Ann. 595, Voyage de Misson, tom. iii. p. 54.

† Voyage de Tavernier, tom i. p. 41 et 298.

‡ Relation de Thevenot, p. 11.

§ Voyage de l'Hallier, p. 30.

|| Descript. des l'Egypte, par Maillet, tom ii. p. 121.

¶ Voyage de Bosman, p. 437.

** Description du Cap de Bonne Esperance, par Kolbe, tom. iii. p. 25.

differs from our buffalo only by very slight varieties.

3. *The bubalus of the Greeks and Latins is neither the buffalo, nor the small ox of Belon, but the animal described in the Memoirs of the Academy of Sciences, under the name of the Barbary Cow.* The following facts will prove this position. Aristotle * ranks the bubalus with the stag and fallow deer, and not with the ox †. In another place he mentions the bubalus along with the roe deer; and remarks, that he makes a bad defence with his horns, and that he flies from all ferocious animals. Pliny ‡, speaking of the wild oxen of Germany, says, that it is only from ignorance that the vulgar give the name of *bubalus* to these oxen; for the bubalus is an African animal, which resembles, in some measure, a calf or a stag. Hence the bubalus is a timid creature, his horns are useless to him, and, to avoid the assaults of ferocious animals, he has no other resource but flight; of course he is nimble, and he is related, by his figure, both

* Genus id fibrarum cervi, damæ, bubali sanguini deest. — *Arist. Hist. Anim.* lib. iii. cap. 6.

† Bubalis etiam capreisque interdum cornua inutilia sunt: nam etsi contra nonnulla resistant, et cornibus se defendant, tamen feroces pugnacesque belluas fugiunt. — *Idem. de Part. Animal.* lib. iii. cap. 11.

‡ Germania gignit insignia bouum ferorum genera, jubatos bisontes, excellentique vi et velocitate uros, quibus imperitum vulgus *bubalorum* nomen imposuit; cum id gignat Africa; vituli potius cervive quadam similitudine. — *Plin. Hist. Nat.* lib. viii. cap. 15.

to the cow and the stag. All these characters, none of which apply to the buffalo, are combined in the animal whose figure was sent by Horatius-Fontana to Aldrovandus*, and of which the gentlemen of the academy† have likewise given a figure and description, under the name of the *Barbary cow*; and they agree with me in thinking, that it is the bubalus of the ancients‡. The zebu, or small ox of Belon, has none of the characters of the bubalus; for the zebu differs as much from the bubalus as the ox from the antelope; and Belon is the only naturalist who regarded this small ox as the bubalus of the ancients.

4. *The small ox of Belon is only a variety of the common ox.* This position may be easily proved by simply referring to the figure of the animal given by Belon, Prosper Alpinus, and Edwards, and to our own description of it. We have seen it alive: its conductor told us, that it came from Africa, where it was called *zebu*; that it was domestic, and was used for riding. It is, indeed, a very mild and even a caressing animal. Its figure, though thick and squat, is agreeable. It has, however, so perfect a resemblance to the ox, that I can give no better idea of it, than by remarking, that if a handsome bull were viewed

* Aldrov. de Quad. Bisulc. p. 365.

† Mem. pour servir à l'Hist. des Animaux, part ij. p. 24.

‡ This animal should rather be regarded as the bubalus of the ancients, than the small African ox described by Belon.—*Id. ibid.* p. 26.

through a glass which diminished objects one half, this contracted figure would be that of the zebu.

The description I made of this animal, in the year 1752, is inserted below in the note *. It

* This small ox has a perfect resemblance to that of Belon. Its crupper is round, and plumper than that of the common ox. It is so gentle and familiar, that it licks the hand like a dog, and caresses every person who approaches. It is a very beautiful animal; and its intelligence seems to be equal to its docility. We were informed by its conductor, that it was brought from Africa, and that its age was twenty-one months. Its colour was white, mixed with yellow and a little red. All the legs were white. The hair on the spine of the back, for about a foot wide, is black, and the tail of the same colour. In the middle of this black band, there is on the crupper a small white streak, the hairs of which stand erect like bristles. It had no mane, and there was very little hair on the tuft. The hair of the body is very smooth and short. It was five feet seven inches in length, from the end of the muzzle to the origin of the tail, five feet one inch in circumference behind the fore-legs, five feet six inches at the middle of the body, and five feet one inch above the hind-legs. The circumference of the head, taken before the horns, was two feet ten inches, and that of the muzzle, taken behind the nostrils, was one foot three inches. The fissure of the mouth, when shut, was eleven inches. The nostrils were two inches long by one broad; and from the end of the muzzle to the eye measured ten inches. The eyes were distant from each other about six inches; and from their posterior angle, to the aperture of the ears, measured four inches. The ears were situated behind and a little to one side the horns, and were near seven inches long, and nine inches in circumference at the base. The distance between the horns was little more than four inches; they were one foot two inches in length, six inches in circumference at the base, and, at half an inch from the points, only an inch and a half. They were of the ordinary colour of horn, and black near the extremities,

corresponds very well with the figure and description * given by Belon, which I have also inserted, that the reader may have an opportunity of comparing them. Prosper Alpinus†, who describes this animal, and gives a figure of it, says that it is found in Egypt. His description agrees with mine, and also with Belon's. The only differences between the three are in the colour of the horns and hair. The zebu of Belon

which were distant from each other one foot seven inches. The bunch, which consisted entirely of flesh, was seven inches in perpendicular height. The colour of the hair which covered it was blackish; and an inch and a half long. The tail, to the end of the vertebrae, was little more than two feet long; but, including the hair, which hangs down to the ground, it was two feet ten inches and a half. The longest hairs of the tail measured one foot three inches. The testicles were a foot and a half distant from the anus. It had four paps, situated like those of the bull.

* This is a very small bull; it is thick, fat, smooth, and well shaped. . . . It was already old, though its body was not so large as that of a stag; but it was more squat, and thicker than a roebuck, and so neat and compact in all its members, that it was extremely agreeable to behold. . . . Its feet resembled those of the ox; and its legs were short and squat. Its neck is thick and short, and the dewlap very small. It has the head of an ox; and the horns rise from a bone on the top of the head. They are black, much notched, like those of the Gazelle, or Barbary antelope, and formed like a crescent. . . . It has the ears of a cow; its shoulders are plump, and a little elevated; its tail is long, and covered with black hair. It has the appearance of an ox, only it is not so tall. . . . We have here given a figure of it.—Belon adds, that this small ox was brought to Cairo from Azamia, a province of Asia, and that it is also found in Africa.—*Obs. de Belon*, fol. 118.

† Prosp. Alpin. Hist. Nat. Egypt, p. 233.

was yellow on the belly, brown on the back, and had black horns. That of Prosper Alpinus was red, marked with small spots, with horns of the ordinary colour. Ours was of a pale yellow, almost black on the back, with horns of the same colour of those of a common ox. In the figures of Belon and Prosper Alpinus, the bunch on the back is not sufficiently marked. The opposite error takes place in the figure which Mr. Edwards * has lately given of this animal, from a drawing communicated to him by Sir Hans Sloane; for the bunch is too large. Besides, the figure is incomplete; for it seems to have been drawn from a very young animal, whose horns were only beginning to shoot. It came, says Mr. Edwards, from the East Indies, where these small oxen are used as we do horses. From all these hints, and likewise from the varieties in the colour, and the natural mildness of this animal, it is apparent, that it belongs to the bunched race of oxen, and has derived its origin from a domestic state, in which the smallest individuals have been chosen for a breed; for, in general, we find, that the bunched oxen in a domestic state, like our own domestic kind, are smaller than those in a wild state. These facts shall afterwards be fully confirmed by the testimonies of travellers.

5. *The bönasus of Aristotle is the same animal with the bison of the Latins.* This proposition cannot be proved without a critical discus-

* Nat. Hist. of Birds, p. 200.

sion, with which I shall not fatigue the reader*. Gesner, who was a man of literature as well as a naturalist, and who thought, as I do, that the bonasus might probably be the bison, has examined the notices given of the bonasus by Aristotle with more care than any other person; he has, at the same time, corrected several erroneous expressions in Theodore Gaza's translation; which errors, however, have been servilely copied by all the succeeding naturalists. From these assistances, and by rejecting from the remarks of Aristotle whatever is obscure, contradictory, or fabulous, the following seems to be the result. The bonasus is a wild ox of Pæonia, and is equally large, and of the same figure with the domestic ox. But his neck, from the shoulders to the eyes, is covered with long hair, which is softer than the mane of a horse. He has the voice of an ox. His horns are short, and bended down round the ears. His legs are covered with long hair, as soft as wool; and his tail is short in proportion to his size, though in every other respect it is similar to that of the ox. Like the bull, he has the habit of raising the dust with his feet. His skin is hard, and his flesh tender and good. From these characters, which are all that can be collected from

* Here it is necessary to compare what Aristotle has said of the bonasus (*Hist. Anim.* lib. ix. cap. 45) with what he elsewhere remarks (*lib. de Mirabilibus*), and likewise the particular passages in his *Hist. Anim.* lib. ii. c. 1, et 16, and also to read Gesner's dissertation on this subject. — *Hist. Quadr.* p. 121.

the writings of Aristotle, we see how nearly the bonasus approaches to the bison. Every article, indeed, corresponds, except the form of the horns, which, as was formerly remarked, varies considerably in animals that belong to the same species. We have seen horns bended in the same manner, which were taken from a bunched ox of Africa; and we shall afterwards prove, that this bunched ox is nothing but the bison. What I now advance may likewise be confirmed by the testimonies of ancient authors. Aristotle calls the bonasus a Pæonian ox; and Pausanias*, speaking of the Pæonian bull, says, in two different places, that these bulls are bisons. He likewise tells us, that the Pæonian bulls, which he saw at the Roman shows, had very long hair on the breast, and about the jaws. Lastly, Julius Cæsar, Pliny, Pausanias, Solinus, &c., when speaking of wild oxen, mention the aurochs and the bison, but take no notice of the bonasus. We must, therefore, suppose that, in the course of four or five centuries, the species of bonasus has been lost, unless we allow that the terms *bonasus* and *bison* denote only the same animal.

6. *The bison of America might proceed originally from the European bison.* The foundation of this opinion has already been laid in our Dissertation on the Animals peculiar to the two Continents†. It was from the experiments of M. de la Nuë

* Pausan. in Beoticiis et Phocicis.

† See vol. vi.

that we derived much information on this subject. From him we learn, that the bisons, or bunched oxen of India and Africa, produce with the European bulls and cows, and that the bunch is only an accidental character, which diminishes in the first generation, and totally disappears in the second or third. Since the Indian bisons are of the same species with our oxen, and, of course, have the same origin, is it not natural to extend this origin to the American bison? In support of this supposition, every thing seems to concur. The bison appears to be a native of cold and temperate regions. His name is derived from the German language. The ancients tell us, that he was found in that part of Germany which borders upon Scythia*; and there are still bisons in the northern parts of Germany, in Poland, and in Scotland. Hence they might pass to America, or come from that country, as they are animals common to both continents. The only difference between the European and American bisons is, that the latter are smaller. But even this difference is a farther proof that they belong to the same species; for it was formerly remarked, that, in general, both the domestic and wild animals, which have spontaneously passed, or been transported into America, have uniformly diminished in size. Besides, all the characters, not excepting the bunch, and the long hair on the anterior parts of

* *Paucissima Scythia gignit animalia, inopia fructus, pauca contermina illi Germania, insignia tamen boum ferorum genera, jubatos bisontes.* — *Plin. Hist. Nat. lib. viii. cap. 13.*

the body, are the same in the American and European bisons. Hence these animals must be regarded as not only of the same species, but as proceeding from the same race*.

7. *The urus, or aurochs; is the same animal with the common bull in its natural and wild state.* This position is evident from the figure of the aurochs, and its whole habit of body, which are perfectly similar to those of our domestic bull. The aurochs, like every other animal that enjoys liberty, is only larger and stronger. The aurochs is still found in some northern provinces: the young aurochs have sometimes been carried off from their mothers, and, after being reared to maturity, they produced with our domestic bulls and cows†. Hence these animals must unquestionably belong to the same species.

8. *Lastly, the bison differs from the aurochs by accidental varieties only; and, consequently,*

* Several persons of note have reared small oxen and wild cows, which are found in Carolina, and in other countries as far south as Pennsylvania. These small oxen are tamed; but they still retain so much of their natural ferocity, that they pierce through every hedge which opposes their passage. Their heads are so strong, that they overturn the pallisades of their inclosures, to come at the cultivated fields, where they do much mischief; and, as soon as a passage is opened, they are followed by the whole flock of domestic cattle. These two kinds couple together, and have given rise to an intermediate kind. — *Voyage de Pierre Kalm*, p. 350.

† Epist. ant. Schmebergensis, ad Gesnerum, *Hist. Quad.* p. 141.

it is, as well as the aurochs, of the same species with the domestic ox. The bunch, the length and quality of the hair, and the figure of the horns, are the sole characters by which the bison can be distinguished from the aurochs. But we have seen the bunched oxen produce with the common domestic kind; we likewise know, that the length and quality of the hair, in all animals, depend on the nature of the climate; and we have remarked, that, in the ox, sheep, and goat, the form of the horns is various and fluctuating. These differences, therefore, are by no means sufficient to constitute two distinct species: and, since our domestic cattle produce with the bunched Indian oxen, they would likewise undoubtedly produce with the bison or bunched ox of Europe. Among the almost innumerable varieties of these animals in different climates, there are two primitive races, both of which have long continued in a natural state, the bison, or bunched ox, and the aurochs, or ox without a bunch. These races have subsisted either in a wild or domestic state, and have been diffused, or rather transported by men into every climate of the globe. All the domestic oxen without bunches have proceeded originally from the aurochs, and all the bunched oxen have been derived from the bison. To obtain a just idea of these varieties, we shall give an enumeration of them as they exist in different parts of the world.

To begin with the north of Europe; the small

bulls and cows of Iceland *, though they belong to the same race with our oxen, are deprived of horns. The magnitude of these animals depends more on the abundance and quality of their pasture, than on the nature of the climate. The Dutch † bring meager cattle from Denmark, which fatten prodigiously in their rich meadows, and give a great quantity of milk. These Danish cattle are much larger than ours. The cows and bulls of the Ukraine, where the pasture is excellent, are reckoned to be the largest in Europe ‡ and are of the same race with the common kind. In Switzerland, where the tops of the first mountains are covered with verdure and flowers, and are solely destined for the feeding of cattle, the oxen are nearly double the size of those in France, where they are commonly fed upon gross herbage, which is despised by the horses. During winter, bad hay and leaves are the common food of our oxen; and, in spring, when they stand in need of being re-

* *Islandi domestica animalia habent vaccas, sed multæ sunt mutilæ cornibus.* — *Dithmar Blefken. Island.* p. 49.

† About the month of February, vast numbers of meager cows are brought from Denmark, which the Dutch peasants turn into their meadows. They are much larger than those of France; and each of them yields from eighteen to twenty Paris pints of milk a day. — *Voyage Hist. de l'Europe*, tom. v. p. 77.

‡ In the Ukraine, the pasture is so excellent, that the cattle are much larger than in any other part of Europe. It requires a man above the common stature to be able to lay his hand on the middle of an ox's back. — *Relat. de la Grande Tartarie*, p. 227.

cruited, they are excluded from the meadows. Hence they suffer more in spring than in winter; for they then hardly receive any thing in the stable, but are conducted into the highways, into fallow grounds, or into the woods, and are always kept at a distance from fertile land; so that they are more fatigued than nourished. Lastly, in summer, they are permitted to go into the meadows, which are then eat up, and parched with drought. During the whole year, therefore, these animals are never sufficiently nourished, nor receive food agreeable to their nature. This is the sole cause which renders them weak, and of a small size; for, in Spain, and in some districts of our provinces, where the pasture is good, and reserved for oxen alone, they are much larger and stronger.

In Barbary, and most parts of Africa, where

* In the kingdom of Tunis and Algiers, the oxen and cows, generally speaking, are not so large as those of England. After being well fattened, the largest of them seldom weigh above five or six hundred pounds. The cows give very little milk, and it commonly dries up when their calves are taken from them.—*Shaw's Travels*. Boves domestici, quotquot in Africæ montibus nascuntur, adeo sunt exigui, ut aliis collati, vituli biennes appareant, monticolæ tamen illos aratro exercentes tum robustos, tum laboris patientes asserunt.—*Leon. Afric. Africa Descript.* tom. ii. p. 753. The cows of Guinea are dry and meager, . . . Their milk is so poor and scanty, that twenty or thirty of them are hardly sufficient to serve the general's table. These cows are very small and light; one of the best of them, when full grown, weighs not above two hundred and fifty pounds, though, in proportion to its size, it ought to weigh one half more.—*Voyage de Boissier*, p. 236.

the lands are dry, and the pasture poor, the oxen are still smaller, the cows give much less milk than ours, and most of them lose their milk with their calves. The same remark applies to some parts of Persia*, of Lower Æthiopia†; and of Great Tartary‡; while, in the same countries, and at no great distances, as in Calmuck Tartary§, in Upper Æthiopia||, and in Abyssinia¶, the oxen are of a prodigious size. Hence this difference depends more on the quantity of food, than on the temperature of the climate. In the northern and temperate, as well as in the warm regions, we find, at very inconsiderable distances, large or small oxen, accord-

* The people of Caramania, at a little distance from the Persic Gulf, have some goats and cows; but their horned cattle are not stronger than calves, or Spanish bulls of a year old; and their horns exceed not a foot in length.—*Ambassade de Silva Figueroa*, p. 62.

† In the province of Guber in Æthiopia, a number of large and small cattle are reared; but their cows are not larger than our heifers.—*L'Afrique de Marmol*, tom. iii. p. 66.

‡ At Krasnojarsk, the Tartars have a number of cattle; but a Russian cow gives twenty times as much milk as one of theirs.—*Voyage du Gmelin à Kamtschatka*.

§ The oxen, in the provinces occupied by the Calmuck Tartars, are still larger than those of the Ukraine, and taller than in any other part of the world.—*Relat. de la Grande Tartarie*, p. 228.

|| In Upper Æthiopia, the cows are as large as camels, and without horns.—*L'Afrique de Marmol*, tom. iii. p. 157.

¶ The riches of the Abyssinians consist chiefly in cows. . . . The horns of the oxen are so large, that they hold twenty pints. They are used by the Abyssinians for pitchers and bottles.—*Voyage de Abyssinie du P. Lobo*, tom. i. p. 57.

ing to the quantity and quality of the pasture they have to feed upon.

The race of aurochs, or of the ox without a bunch, occupies the frozen and temperate zones, and is not much diffused over the southern regions. The race of the bison, or bunched ox, on the contrary, occupies all the warm climates. In the whole continent of India*, in the eastern

* The oxen which draw coaches in Surat are white, of a good size, and have two bunches like those of certain camels. They run and gallop like horses, and are garnished with splendid housing, and a number of small bells fixed to their necks. When the animals are in motion, the bells are heard at a considerable distance, and their noise in the streets is very agreeable. These coaches are used not only in the cities of India, but in travelling through the country—*Voyage de Pietro della Valle*, tom. vi. p. 273. The carriages of the Mogul are a kind of coaches with two wheels. They are drawn by oxen, which, though naturally heavy and slow in their movements, acquire, by long habit, such a dexterity in drawing these carriages, that no other animal can outrun them. Most of these oxen are very large, and have a bunch between their shoulders, which rises to the height of six inches—*Voyage de Jean Ovington*, tom. i. p. 258. The oxen of Persia are like our own, except on the frontiers of India, where they have a bunch on the back. Few oxen are eaten in this country: they are reared chiefly for labouring the ground, or for carrying burdens. Those employed in carrying loads are shod, on account of the stony mountains they have to pass.—*Voyage de Chardin*, tom. ii, p. 28. The oxen of Bengal have a kind of bunch on the back. We found them as fat and as well tasted as in any other country. The largest and best sell at two rixdollars only.—*Voyage de la Compagnie des Indes de Hollande*, tom. iii. p. 270. The oxen of Guzarat are shaped like ours, except that they have a bunch between the shoulders.—*Voyage de Mandelslo*, tom. ii, p. 234.

and southern islands*, throughout all the regions of Africa†, from Mount Atlas to the Cape of Good Hope‡; there are but few oxen without bunches. It even appears that this race, which is diffused over all the warm countries, has several advantages over the other; for, like the bison, from which they have proceeded,

* In the island of Madagascar, an immense number of oxen are reared: they are very different from those of Europe, each of them having a bunch of fat on their backs, in the form of a wen, which has made some authors allege that they are suckled by camels. There are three kinds, namely, those which have horns, those which have pendulous horns attached to the skin, and those which have no horns, but only a small osseous eminence, in the middle of their front, covered with skin. The last kind fail not, however, to combat other bulls, by striking their bellies with their heads. They all run like our stags, and have longer legs than those of Europe.—*Voyage de Flacourt*, p. 3. The oxen in the island of Johanna, near the Mosambique coast, differ from ours. They have a fleshy crescent between the neck and back. This portion of flesh is preferred to the tongue, and is as well tasted as the marrow.—*Grosse's Travels*, p. 42.

† The oxen of Agnada-Sanbras are likewise larger than those of Spain. They have bunches, but no horns—*Premier Voyage des Hollandois aux Indes Orientales*, tom. i. p. 218. The Moors have numerous flocks on the banks of the Niger. . . . Their oxen are much thicker, and have longer legs than those of Europe. They are remarkable for a large fleshy wen, which rises between their shoulders more than a foot high. This wen is a delicious morsel.—*Voyage au Senegal, par M. Adanson*, p. 57.

‡ At the Cape of Good Hope, there are three kinds of oxen, which are all large, and very swift. Some of them have a bunch on the back; others have pendulous horns; and others have horns like those of the European kind.—*Voyage de Francois le Guat*, tom. ii. p. 147.

these bunched oxen have softer and more glossy hair than ours, whose hair, like that of the aurochs, is hard, and thinly spread over the body. They are likewise swifter, more proper for supplying the place of the horse*, and, at the same

* As the oxen in India are perfectly gentle, many people travel on them as we do on horses. Their common pace is soft. Instead of a bit, a small cord is passed through the cartilage of their nostrils, which is tied to a larger cord, and serves as a bridle; and this bridle is fixed to a bunch on the fore part of the back, which is wanting in our oxen. They are saddled like horses, and, when pushed, move as briskly. These animals are used in most parts of India; and no other are employed in drawing carts and chariots. They are fixed to the end of the beam by a long yoke, which is placed on the necks of the two oxen; and the driver holds the rope to which the cord that passes through the nostrils is tied.—*Relation de Thevenot*, tom. iii. p. 151. This Indian prince was seated on a chariot drawn by two white oxen, with short necks, and bunches on their shoulders; but they were as swift and alert as our horses.—*Voyage d'Olearius*, tom. i. p. 458. The two oxen which were yoked to my coach cost near 600 rupees. This price need not astonish the reader; for some of these oxen are very strong, and perform journeys of sixty days, at the rate of from twelve to fifteen leagues a day, and always at a trot. When one half of the day's journey is finished, each of them is supplied with two or three balls, of the size of a penny loaf, made of flour kneaded with butter and black sugar; and, at night, their common food is chick-peas bruised, and steeped for half an hour in water.—*Voyage de Tavernier*, p. 36. Some of these oxen follow the horses at a smart trot. The smallest are the most nimble. The Gentoos, and particularly the Banians and merchants of Surat, use these oxen for drawing their carriages. It is remarkable, that, notwithstanding their veneration for these animals, the people scruple not to employ them in such laborious services.—*Grosier's Travels*, p. 253.

time, not so stupid and indolent as our oxen. They are more tractable and intelligent*, and have more of those relative feelings from which advantage may be derived. They are likewise treated with more care than our best horses. The respect the Indians entertain for these animals is so great†, that it has degenerated into superstition, which is the ultimate step of blind veneration. The ox, being the most useful animal, has appeared to them to merit the greatest reverence. This venerable object they have converted into an idol, a kind of beneficent and powerful divinity; for every thing we respect must be great, and have the power of doing much good or much evil.

* In the country of Camandu in Persia, there are many oxen entirely white, with small blunt horns, and bunches on their backs. They are very strong, and carry heavy burdens. When about to be loaded, they lie down on their knees like the camels, and rise again when the goods are properly fastened. To this practice they are trained by the natives. — *Description de l'Inde, par Marc. Paul*, liv. i. c. 22. The European labourers prick their oxen with a goad, in order to make them advance. But, in Bengal, their tails are only twisted. These animals are extremely tractable. When loading, they are instructed to lie down, and to rise with the burdens on their backs. — *Lett. Edif. recueil* ix. p. 422.

† The queen is attended with the ladies of fashion, and the pavement or roads through which she passes are strewed with the dung of the cows formerly mentioned. These people have such a veneration for their cows, that they are allowed to enter the king's palace, and are never stopped on their passage, wherever they choose to go. The king and all the nobles give place to these cows, as well as to the bulls and oxen, with every possible mark of respect and veneration. — *Voyage de Francois Pyrard*, tom. i. p. 449.

These bunched oxen vary perhaps more than ours in the colour of the hair and the figure of their horns. The most beautiful are white, like those of Lombardy*. Some of them have no horns; the horns of others are very high, and in others they are almost pendulous. It even appears that this first race of bisons, or bunched oxen, should be divided into two secondary races, the one large, and the other small, which last comprehends the zebu. Both are found nearly in the same climates†, and are equally gentle and easily managed. Both have fine hair, and bunches on their backs. This bunch is only an excrescence, a fleshy wen, which is equally tender and good as the

* All the cattle of Italy are gray or white. — *Voyage de Burnet*, part ii. p. 12. The oxen of India, and especially those of Guzarat and of Cambaya, are generally white, like those of Milan. — *Grosse's Travels*, p. 253.

† The oxen of India are of different sizes, some large, others small, and others of a middle size. But, in general, they travel well, some of them making journeys of fifteen leagues a day. Some of them are near six feet high; but these are rare. There is another kind called *dwarfs*, because they exceed not three feet in height. The latter, like the others, have a bunch on their backs, run very fast, and are used for drawing small carts. The white oxen are extremely dear. I have seen two, which belonged to the Dutch, each of which cost two hundred crowns. They were indeed very beautiful and strong; and the chariot in which they were yoked had a magnificent appearance. When the people of fashion have fine oxen, they take great care of them. The tips of their horns are ornamented with copper rings. They are covered with clothes in the same manner as horses: they are daily curried, and fed with great attention. — *Relat. d'un Voyage par Thevenot*, tom. iii. p. 252.

tongue of an ox. The bunches of some oxen weigh from forty to fifty pounds*, and those of others are much smaller†. In some, the horns are prodigiously large. In the Royal Cabinet, there are specimens of them of three feet and a half in length, and seven inches in diameter at the base. We are assured by several travellers, that they have seen horns which could contain fifteen, and even twenty pints of water.

Throughout all Africa‡, the large cattle are never castrated; and this operation is not much practised in India§. When the bulls are castrated, the testicles are not cut off, but compressed. Though the Indians keep a great number of these animals for drawing their carriages and ploughing the ground, they do not rear so many as we do. As, in all warm countries, the cows give little milk, as the natives are unacquainted with butter or cheese, and as the flesh of the calves is not so good as in Europe, the inhabitants do not greatly multiply horned cattle. Besides, in all the southern provinces of Africa

* At Madagascar, there are oxen whose bunch weighs thirty, forty, fifty, and even sixty pounds. — *Voyage à Madagascar, par de V. Paris*, p. 245.

† The oxen have a bunch near the neck, which is larger and smaller in different individuals. — *Mémoires de Thérèse*, tom. ii. p. 223.

‡ Along the coast of Guinea, we see bulls and cows only; for the Negroes understand not the practice of castration. — *Voyage de Bougainville*, p. 236.

§ When the Indians castrate their bulls, it is not by incision, but by the compression of ligatures, which prevents the nourishment of the parts. — *Grosier's Travels*, p. 253.

and Asia, being more thinly peopled than those of Europe, there are a number of wild oxen, which are taken when young. They tame spontaneously, and submit, without resistance, to all kinds of domestic labour. They become so tractable, that they are managed with as much ease as horses: the voice of their master is sufficient to direct their course, and to make them obey. They are shod*, curried, caressed, and supplied abundantly with the best food. These animals, when managed in this manner, appear to be different creatures from our oxen, which only know us from our bad treatment. The goad, blows, and hunger, render them stupid, refractory, and feeble. If we had a proper knowledge of our own interest, we should treat our dependents with greater lenity. Men of inferior condition, and less civilized, seem to have a better notion than other people of the laws of equality, and of the different degrees of natural equity. The farmer's servant may be said to be the peer of his master. The horses of the Arab, and the oxen of the Hottentot, are favourite domestics, companions in exercises, assistants in every labour, and participate the ha-

* As the roads in the province of Asmer are very stony, the oxen are shod before they set out on long journeys. They are thrown on the ground by ropes fixed to their feet. When in this situation, their four feet are placed on a machine made of two cross sticks. At the same time, two thin, light pieces of iron are fixed to each foot, and cover not above one half of the hoof. They are fixed by three nails, above an inch in length, which are rivetted on the opposite side. — *Relat. de Thavenot*, tom. iii. p. 150.

bitation, the bed, and the table of their masters. Man, by this communication, is not so much degraded as these brutes are exalted and humanized. They acquire affectionateness, sensibility, and intelligence. There they perform every thing from love, which they do here from fear. They do more; for as their nature is improved by the gentleness of their education, and the perpetual attention bestowed on them, they become capable of performing actions which approach to the human powers. The Hottentots* train their oxen to war, and employ them nearly in the same manner as the Indians employ the elephants. These oxen are instructed to guard the flocks†, which they

* The Hottentots have oxen which they employ successfully in their combats. These animals are called *backeleys*, from the word *backeley*, which, in the Hottentot language, signifies *war*. In all their armies there are considerable troops of those oxen, which are easily governed, and which are let loose by the chief, when a proper opportunity occurs. They instantly dart with great impetuosity on the enemy. They strike with their horns, kick, overturn, and trample under their feet every thing that opposes their fury. Hence, if not quickly turned back, they run ferociously into the ranks, which they soon put into the utmost disorder, and thus prepare an easy victory for their masters. The manner in which these animals are trained and disciplined, reflects much honour on the genius and ability of the Hottentots. — *Voyage du Cap de Bonne Esperance, par Kolbe*, tom. i. p. 160.

† These *backeleys* are likewise of great use in guarding the flocks. When pasturing, at the smallest signal from the keeper, they bring back and collect the wandering animals. They also run with fury upon strangers, which makes them a great security against the attacks of the *buschies*, or robbers of cattle. Every *Kraal* has at least six of these *backeleys*,

conduct with dexterity, and defend them from the attacks of strangers and ferocious animals. They are taught to distinguish friends from enemies, to understand signals, and to obey their master's voice. Thus the most stupid of men are the best preceptors to brutes. How does it happen, that the most enlightened man, instead of managing his fellow creatures, has so much difficulty in conducting himself?

Thus the bisons, or bunched oxen, are dif-

which are chosen from among the fiercest oxen. When one of them dies, or becomes unserviceable by age, another is selected from the flock to succeed him. The choice is made by one of the oldest Kraals, who is supposed to distinguish the animal that will be most easily instructed. This novice is associated with one of the most experienced backeleys, and he is taught to follow his companion, either by blows, or by other means. In the night, they are tied together by the horns, and are likewise kept in the same situation during part of the day, till the young ox is completely trained to be a vigilant defender of the flock. These backeleys, or keepers of the flocks, know every inhabitant of the *kraal*, and show the same marks of respect for all the men, women, and children, as a dog does for those who live in his master's family. Hence, these people may approach their cattle with the utmost safety; for the backeleys never do them the smallest injury. But, if a stranger, and particularly an European, should use the same freedom, without being accompanied with a Hottentot, his life would be in the greatest danger. These backeleys, which pasture all around, would soon run upon him at full gallop, and, if not protected by the shepherds, by fire arms, or by suddenly climbing a tree, his destruction is inevitable. In vain would he have recourse to sticks or stones: a backeley is not to be intimidated by such feeble weapons.—*Description du Cap de Bonne Espérance, par Kolbe, part i. chap. 20, p. 307.*

fused over all the southern parts of Africa and Asia. They vary greatly in size, in colour, in the figure of the horns, &c. On the contrary, in all the northern regions of these two quarters of the world, and in the whole of Europe, including the adjacent islands, as far as the Azores, there are only oxen without bunches*, which derive their origin from the aurochs. And, as the aurochs, which is our ox in a wild state, is larger and stronger than the domestic kind, the bison, or wild ox with a bunch, is likewise stronger and larger than the Indian domestic ox. He is also sometimes smaller; but the size depends solely on the quantity of food. In Malabar†, Canara, Abyssinia and Madagascar, where the meadows are fertile and spacious, the bisons are of a prodigious size. In Africa, and in Arabia Petrea‡, where

* The oxen of Tercera are the largest and finest in Europe. Their horns are very large. They are so gentle and tame, that from a flock consisting of more than a thousand, a single animal, upon its name being called by the proprietor (for every individual has its peculiar name, like our dogs), instantly runs to him.—*Voyage de la Compagnie des Indes de Hollande*, tom. i. p. 490.—See also *Le Voyage de Mandelslo*, tom. i. p. 478.

† In the mountains of Malabar and Canara, there are wild oxen so large, that they approach the stature of the elephant; while the domestic oxen of the same country are small, meager, and short lived.—*Voyage du P. Vincent Marie*, chap. 12.

‡ I saw at Mascati, a town of Arabia Petrea, another species of mountain ox, with glossy hair, as white as that of the ermine. It was so handsomely made, that it rather resembled a stag than an ox. Its legs, indeed, were shorter;

the ground is dry and sterile, the zebus or bison^s are of a small size.

Oxen without bunches are spread America. They were successively introduced thither by the Spaniards and other Europeans. These oxen have greatly multiplied, but have become smaller in these new territories. This species was absolutely unknown in South America. But, in all the northern regions, as far as Florida, Louisiana, and even in the neighbourhood of Mexico, the bison^s, or bunched oxen were found in great numbers. These bison^s, which formerly inhabited the woods of Germany, of Scotland, and other northern countries, have probably passed from the Old to the New Continent. Like all the other animals, their size has diminished in America; and according as they lived in climates more or less cold, their hair became longer or shorter. In Hudson's Bay, their beard and hair are longer and more bushy than in Mexico; and, in general, their hair is softer than the finest wool*. We cannot hesi-

but they were fine and nimble. The neck was short. The head and tail resembled those of the common ox, but were better shaped. The horns are black, hard, straight, beautiful, about three or four palms in length, and garnished with rings, which seem as if they had been turned in a lathe. — *Voyage du P. Vincent Marie*, chap. 12.

* The wild oxen of Louisiana, instead of hair, are covered with wool as fine as silk, and all curled. It is longer in winter than in summer, and is much used by the inhabitants. On their shoulders they have a pretty high bunch. Their horns are very fine, and are used by the hunters for carrying their powder. Between the horns and toward the top of the head,

tate in pronouncing these bisons of the New Continent to be the same species with those of the Old. They have preserved all the principal characters, as the bunch on the shoulders, the long hair under the muzzle and on the anterior parts of the body, and the short legs and tail; and upon comparing what has been said of them by Hernandez *, Fernandez †, and all the other travellers and historians of the New World ‡, with what has been delivered concerning the European bison, by ancient and modern naturalists §, we shall be convinced that they are not animals of different species.

The ox and bison are two distinct races of the same species. Though the bison uniformly differs from the ox by the bunch on his back, and the length of his hair, he succeeds very well in the Isle of France: his flesh is much better than

there is a tuft of hair so thick, that a pistol bullet, though discharged ever so near, cannot penetrate it. I tried the experiment myself. The flesh of these oxen is excellent, as well as that of the cow and calf; its flavour and juice are exquisite. — *Mem. sur la Louisiane, par M. Dumont, p. 75.*

* Hernand. Hist. Mex. p. 587.

† Fernand. Hist. Nov. Hisp. p. 10.

‡ Singularités de la France Antarctique, par Thetvet, p. 148. — Memoir sur la Louisiane par Dumont, p. 75. — Description de la Nouvelle France, par le P. Charlevoix, tom. iii. p. 130. — Lettres Edif. xi. recueil, p. 318, et xxiii. recueil, p. 298. — Voyage de Robert Lade, tom. ii. p. 315. — Dernieres Decouvertes dans l'Amerique septentrionale, par M. de la Salle, p. 104, &c. &c.

§ Plin. Hist. Nat. lib. viii. — Gesner, Hist. Quad. p. 128. — Aldrov. de Quad. Bia. p. 253. — Rzacinsky, Hist. Nat. Polon. p. 214, &c.

that of the European oxen; and, after some generations, his bunch vanishes entirely. His hair is smoother, his limbs are more slender.

Loss of the bunch.
says M. de Querboënt, who has seen the bison of Madagascar, which were of the same size*.

The bison, of which we here give a figure which we saw alive, was taken, when young, in the forests of the temperate parts of North America. It was brought to Holland, and purchased by a Swede, who transported it from town to town in a large cage, where it was firmly fixed by the head with four ropes. The enormous mane which surrounds its head is not short, but a flowing wool, divided into locks, like old fleece. This wool is very fine, as well as that which covers the bunch and the anterior part of the body.* The parts which appear naked in the engraving, are only so at a certain time of the year, which is rather in summer than in winter; for, in the month of January, all parts of the body were almost equally covered with fine, close, frizzled wool, under

it
tawny. The bunch,
to be

wool only. Though under much restraint, he

NOTE

* Note communicated by M. le Vicomte de Querboënt.



W. H. Woodcut.

BISON.

that of the European oxen; and, after some generations, his bunch vanishes entirely. His hair is smoother, his limbs are more slender, and his horns longer than those of the common ox. I saw, says M. de Querhoënt, bisons brought from Madagascar, which were of an astonishing size *.

The bison, of which we here give a figure, and which we saw alive, was taken, when young, in the forests of the temperate parts of North America. It was brought to Holland, and purchased by a Swede, who transported it from town to town in a large cage, where it was firmly fixed by the head with four ropes. The enormous mane which surrounds its head is not hair, but a flowing wool, divided into locks, like an old fleece. This wool is very fine, as well as that which covers the bunch and the anterior part of the body. The parts which appear naked in the engraving, are only so at a certain time of the year, which is rather in summer than in winter; for, in the month of January, all parts of the body were almost equally covered with a fine, close, frizzled wool, under which the skin was of a sooty colour; but, on the bunch, and all the other parts which are covered with longer wool, the skin is tawny. This bunch, which consists entirely of flesh, varies according to the plight of the animal. To us he appeared to differ from the European by the bunch and the wool only. Though under much restraint, he

* Note communicated by M. le Vicomte de Querhoënt.



e. Bell's engr.

BISON.

was not ferocious, but allowed his keepers to touch and caress him *.

It would appear, that there were formerly bison in the north of Europe. Gesner even asserts, that, in his time, they existed in Scotland. Having inquired into this fact, I was informed, by letters both from Scotland and England, that no remembrance or vestige of them could be traced in that country †. Mr. Bell, in his Travels from Russia to China, mentions two species of

* Professor Pallas had an opportunity to examine the same American bison, which was conducted from town to town, not only in France, but also in Holland and Germany. After comparing it with Ridinger's figure of the urus, and the engravings of the menagery of prince Eugene, at Vienna, Pallas observes, that, in their external form, the two animals are not far removed from each other. The most remarkable difference consists in the nature of the hair, which is woolly, extremely soft, tufted, elastic, and of a black colour, on the head, the neck, and the fore part of the bison; while the same parts are clothed with a hard, thick, and brown hair in the urus. From their analogy to each other, Pallas concludes that Buffon is justified in considering the bison, or wild bull, of North America, as a variety of the European urus, occasioned by the change of climate.

W.

† The white cattle figured by Bewick, and which are now nearly extinct, are of this kind. They were formerly kept in several parks in England and Scotland, but they have been destroyed by various means, and the only herds now remaining in the kingdom, are in the park at Chillingham Castle, in Northumberland, at Wollaton, in Nottinghamshire; at Gisborne, in Craven, Yorkshire; at Lime Hall, in Cheshire; and at Charnley, in Staffordshire. For a particular account of the manners of these wild cattle, see Bewick's Quadrupeds, p. 34.

W.

oxen which he saw in the northern parts of Asia ; one of which was the aurochs, or wild ox, and is the same race with our oxen ; and the other, which we have denominated, ~~after Gmelin~~ the *Tartarian* or *grunting cow*, appeared to be the same species with the bison. After comparing this grunting cow with the bison, I found an exact coincidence in all the characters, except the grunting, instead of bellowing. But I apprehend that this grunting is not constant and general, but contingent and particular, similar to the deep interrupted voice of our bulls, which is never fully exhibited but in the season of love. Besides, I was informed, that the voice of the bison, whose figure I have represented, was never heard, and that though considerably hurt, it did not complain, which induced his master to think that it was mute ; and it is probable that its voice would be developed by grunting or interrupted sounds, when, in full possession of freedom and in presence of a female, the animal's spirits were excited by love.

It is singular, that the bisons, or bunched oxen, whose race appears to be extended in the Old Continent from Madagascar and the point of Africa, and from the extremity of the East Indies as far as Siberia, and that, in the New Continent, though they are found from the country of the Illinois to Louisiana, and even Mexico, they should never have passed the isthmus of Panama ; for there are no bisons in any part of South America, though the climate is perfectly agreeable to their nature, and the European oxen

have multiplied there as well as in any other part of the globe.

At Madagascar, the best kind of bulls and cows were brought thither from Africa, and have a bunch on their backs. The cows yield so little milk, that a single Dutch cow would give six times as much. In this island, there are wild bisons, which wander in the forests. The flesh of these bisons is not equal to that of our oxen *. In the southern parts of Asia, we likewise find wild oxen. The natives of Agra hunt these animals on the mountain of Nerwer, which is surrounded with wood. This mountain is situated on the road from Surat to Golconda. These wild cattle are generally beautiful, and sell very dear †.

The zebu seems to be a miniature of the bison, whose race, as well as that of the ox, has undergone great variations, especially in size. The zebu, though an original native of very warm regions, is capable of existing and multiplying in temperate climates. "I saw," says Mr. Colinson, "a great number of these animals in the duke of Richmond's, and also in the duke of Portland's parks, where they every year bring forth calves, which are extremely beautiful. The fathers and mothers were brought from the East Indies. The bunch on the shoulder is twice as large in the male as in the female, whose stature exceeds that of the male. The young zebu sucks

* Voyage de François le Guat, tom. ii. p. 71.

† Voyage de Thevenot, tom. iii. p. 113.

its mother like other calves; but, in our climate, the milk of the mother soon dries up, and the suckling of the young is completed by the milk of another female. The duke of Richmond ordered one of these animals to be slain; but its flesh was not so good as that of the ox*."

Among the oxen without bunches, there are also small individuals, which, like the zebu, may constitute a particular race. Gemelli Careri, in his journey from Ispahan to Schiras, saw two small cows, which the bashaw of the province had sent to the king, and which exceeded not the size of calves. Though fed solely on straw, they were very fat†. In general, it appears, that the zebu, or small bisons, as well as our little oxen, are more fleshy and fatter than the bisons and oxen of the common size.

Thus the wild and domestic ox of Europe, Asia, Africa, and America, the bonasus, the aurochs, the bison, and the zebu, are animals of the same species, which, according to the differences of climate, of food, and of treatment, have undergone the various changes above described. The ox is not only the most useful animal, but most generally diffused; for it has been found every where, except in South America‡. Its

* Letter from the late Mr. Colinson to M. de Buffon, dated at London, December 30, 1764.

† Voyage de Gemelli Careri, tom. ii. p. 338.

‡ The bunched ox, or wild bison, appears to have inhabited the northern parts of America only, as Virginia, Florida, the country of the Illionois, Louisiana, &c.; for, though Hernandez calls it the *Mexican bull*, we learn from a passage of

constitution is equally adapted to the ardours of the South, and the rigours of the North. It appears to be very ancient in all climates. It is domestic in civilized nations, and wild in desert countries, or among unpolished people. From its own resources, it supports itself in a state of nature, and never loses those qualities which render it serviceable to man. The young wild calves, which are carried off from their mothers in India and Africa, soon become as gentle as those of the domestic race. This conformity in natural dispositions is a still farther proof of the identity of the species. Mildness of character in these animals indicates a physical flexibility in the form of their bodies; for in every species, whose dispositions are gentle, and who have been subjected to a domestic state, there are more varieties than in those who, from an inflexibility of temper, have remained savage.

If it be asked, whether the aurochs or the bison be the primitive race of oxen, a satisfactory answer may be obtained by drawing conclusions

Antonio de Solis, that this animal was a stranger in Mexico, and that it was kept in the menagery of Montezuma with other wild beasts which were brought from New Spain. "In a second court, we saw all the wild beasts of New Spain. They were kept in strong wooden cages. But nothing surprised us so much as the appearance of the Mexican bull, which is a rare animal, and has the camel's bunch on its shoulders, the narrow and meager flank of the lion, a bushy tail and mane, and the horns and cloven foot of the bull. . . . This kind of amphitheatre appeared to the Spaniards worthy of a great prince. — *Hist. de la Conquête du Mexique, par Antonio de Solis*, p. 519.

from the facts already related. The bunch of the bison, as formerly remarked, is an accidental character only, which is effaced by the commixture of the two races. The aurochs, or ox without a bunch, is, therefore the most powerful and predominant race. Were it otherwise, the bunch, instead of disappearing, would extend and subsist in all the individuals proceeding from a mixture of the two races. Besides, this bunch of the bison, like that of the camel, is not so much a production of Nature, as an effect of labour, and a badge of slavery. In all ages, and in every country, the oxen have been obliged to carry burdens. Their backs, by constant and often excessive loads, have been deformed; and this deformity was afterwards transmitted by generation. There remained no oxen without this deformity, except in those countries where they were not employed in carrying burdens.

Throughout all Africa and the East, the oxen are bunched; because, at all periods, they have carried loads on their shoulders. In Europe, where they are employed in the draught only, they have not undergone this deformed change, which is probably occasioned, in the first place, by the compression of the loads, and, in the second, by a redundance of nourishment; for it disappears when the animal is meager and ill fed. Domestic oxen with bunches might escape, or be abandoned in the woods, where their posterity would inherit the same deformity, which, instead of disappearing, would augment by the abundance of food peculiar to all uncultivated

countries; so that this secondary race would spread over all the desert lands of the North and South, and pass, like the other animals which can support the rigours of cold, into the New Continent. The identity of the species of the bison and aurochs is still farther confirmed from this circumstance, that the bisons of North America have so strong an odour of musk, that they have been called *musk oxen* by most travellers *; and, at the same time, we learn, from the testimony of spectators †, that the aurochs, or wild ox of Prussia and Livonia, has the same scent of musk.

Of all the names, therefore, prefixed to this article, which, both by ancient and modern naturalists, are represented as so many distinct spe-

* Fifteen leagues from the river Danoise, is the river called *Sea-wolf*, both in the neighbourhood of Hudson's Bay. In this country, there is a species of ox called the *musk ox*, from his strong odour of musk, which, in certain seasons, renders his flesh uneatable. These animals have very fine wool, which is longer than that of the Barbary sheep. I had some of it sent me to France in the year 1708, of which I made stockings, which were as fine as those of silk. . . . These oxen, though smaller than ours, have larger and longer horns. Their roots join on the top of the head, and descend on the side of the eyes as low as the throat; then the tips mount up in the form of a crescent. I have seen two of them which weighed together sixty pounds. Their legs are so short, that the wool always trails on the ground where they walk, which renders them so unshapely, that it is difficult, at a distance, to know at which end the head is placed. — *Hist. de la Nouvelle France, par le P. Charlevoix*, tom. iii. p. 132. — See also *Le Voyage de Robert Lade*, tom ii. p. 315.

† Ephem. German. decad. ii. ann. 2, observ. 7.

cies, there remain only the buffalo and the ox. These two animals, though very similar, both domestic, often living under the same roof, and fed in the same pastures, though at liberty to intermix, and frequently stimulated to it by their keepers, have uniformly refused to unite. They neither copulate nor produce together. Their natures are more remote from each other than that of the ass and horse: they even seem to have a mutual antipathy; for we are assured, that cows will not suckle young buffaloes, and that female buffaloes refuse to suckle calves. The disposition of the buffalo is more obstinate and untractable than that of the ox. He is less obedient, more violent, and subject to humours more frequent and more impetuous. All his habits are gross and brutal. Next to the hog, he is the dirtiest of domestic animals; for nothing is more difficult than to dress and keep him clean. His figure is gross and forbidding. His aspect is wild and stupid. He stretches out his neck in an awkward, ignoble manner, and carries his head so ungracefully, that it generally hangs down toward the ground. He bellows hideously, and with a stronger and deeper tone than that of the bull. He has meager limbs, a naked tail, a dark countenance, and a skin as black as his hair. He differs chiefly from the ox by this black colour of his skin: it appears under the hair, which is not close. His body is thicker and shorter than that of the ox, his legs longer, his head proportionally smaller, his horns less round, being black and compressed; and he has a tuft

of curled hair on his front. His skin is also thicker and harder than that of the ox. His flesh is black and hard, and has not only a bad taste, but a most disagreeable odour*. The milk of the female buffalo is not so good as that of the cow; but she yields it in much greater quantity † ‡. In warm countries, most cheeses are made of the buffalo's milk. The flesh of young buffaloes, though fed with milk, is not good. The skin is of more value than the rest

* In travelling from Rome to Naples, we are sometimes regaled with cows and buffaloes, and are happy to find them. The flesh of the buffalo is black, hard, and stinking, and none but poor people and the Jews of Rome are in the habit of eating it. — *Voyage de Misson*, tom. iii. p. 54.

† In entering Persia, by the way of Armenia, the first place worthy of notice is called the *Three Churches*, at the distance of three leagues from Erivan. In this country, there are vast numbers of buffaloes, which serve the inhabitants for ploughing their lands. The females yield a great quantity of milk, of which butter and cheese are made: Some females give daily twenty-two pints of milk. — *Voyage de Tavernier*, liv. i. tom. i. p. 41. The female buffaloes go with young twelve months, and often give twenty-two pints of milk a day, of which so great quantities of butter are made, that, in some of the villages on the Tigris, we saw from twenty to twenty-five barks loaded with butter, to be sold along both sides of the Persic Gulf. — *Id. ibid.*

‡ The persons who sell milk in India are commonly called Gaulies: they are of four distinct tribes, but their mode of managing cattle is the same. Near Seringapatam they keep only buffaloes, and twelve females require three men, one woman, and two oxen, to manage them. They are milked early in the morning, and about seven o'clock are sent out to pasture in the waste lands. — *Buchanan's Travels*, vol. i. p. 116. W.

of the animal, the tongue of which alone is good for eating. The skin is solid, pretty flexible, and almost impenetrable. As these animals are larger and stronger than oxen, they are employed with advantage in different kinds of labour. They are made to draw, and not to carry burdens *. They are directed and restrained by means of a ring passed through their nose. Two buffaloes yoked, or rather chained, to a chariot, draw as much as four strong horses. As they carry their neck and head low, the whole weight of their body is employed in drawing; and their mass much surpasses that of a labouring horse.

The height and thickness of the buffalo are sufficient indications that he originated from warm climates. The largest quadrupeds are produced in the Torrid Zone of the Old Continent; and the buffalo, in the order of magnitude, should be ranked next to the elephant, the rhinoceros, and the hippopotamus. The camelpard and the camel are taller, but thinner; and the whole are equally natives of the southern regions of Asia and Africa. Buffaloes, however, live and produce in Italy, in France, and in

* This is not correct, according to the late observations of Dr. Buchanan, who tells us that buffaloes of the northern breed, in India, are sometimes employed, especially by cloth merchants; their great size enabling them with convenience to support a bulky article. They are very fine animals, and their common load is fifteen *maunds*, or about 410 pounds, with which they travel at the rate of twelve or fifteen miles a day: but they require to be better fed than the bullock. — *Buchanan's Travels*, vol. iii. p. 206.

other temperate countries. Those kept in the royal menagery have produced twice or thrice. The female brings forth but one at a birth, and goes with young about twelve months; which is a still farther proof of the difference of this species from that of the cow; whose time of gestation is only nine months. It appears, likewise, that these animals are more gentle and less brutal in their native country; and that, the warmer the country, the more docile is their disposition. In Egypt*, they are more tractable than in Italy, and in India† than in Egypt. The Italian buffaloes have also more hair than those of Egypt, and the Egyptian than those of India‡. Their fur is by no means close;

* The buffaloes are numerous in Egypt. Their flesh is good; and they are not so ferocious as those of Europe. Their milk is of great use, and produces excellent butter.—*Descript. l'Egypte, par Maillet, p. 27.*

† In the kingdom of Aunan and Tonquin, the buffaloes are very tall, and have high shoulders. They are also robust, and such excellent labourers, that one alone is sufficient to draw a plough, though the coulter enters very deep into the ground. Their flesh is not disagreeable; but that of the ox is better and more commonly used.—*Hist. de Tonquin, par le P. de Rhodes, p. 51.*

‡ At Malabar, the buffalo is larger than the ox. He is shaped nearly in the same manner. His head is longer and flatter. His eyes are larger, and almost entirely white. His horns are flat, and often two feet long. His legs are thick and short. He is ugly, and almost without hair. He walks slowly, and carries heavy burdens. Like the cow, they go in flocks, and their milk produces butter and cheese. Their flesh is good, though less delicate than that of the ox. They are excellent swimmers, and traverse the most rapid rivers. We have seen them tamed. But the wild buffaloes are ex-

because they belong to warm climates; and the large animals, in general, of these countries, have little or no hair.

In Africa and India, there are vast quantities of wild buffaloes, which frequent the banks of rivers and extensive meadows. These wild buffaloes go in flocks*, and make great havoc in the cultivated fields. But they never attack men, unless when they are wounded. They are then extremely dangerous†; for they run straight upon the enemy, overturn him, and trample him under their feet. They are, however, afraid at the sight of fire‡, and they abhor

tremely dangerous; for they tear men to pieces, or crush them with a single stroke of their heads. They are less to be feared in the woods than in any other situation; for their horns often entangle among the branches, which gives those time to fly who are pursued. The skin of these animals is used for a number of purposes; and even pitchers are made of it to keep water and other liquors. Those on the Malabar coast are almost all wild; and strangers are not prohibited from hunting and eating them.—*Voyage de Dellon*, p. 110.

* There are such numbers of wild buffaloes in the Philippine isles, that a good hunter, with a horse and a spear, may kill thirty of them in a day. The Spaniards kill the buffalo for his skin, and the Indians for his flesh.—*Voyage de Gemelli Careri*, tom. v. p. 162.

† We are told by the Negroes, that, when they shoot at the buffaloes, without wounding them mortally, they dart with fury on the hunters, and trample them to death. . . . The Negroes watch where the buffaloes assemble in the evening, climb a large tree, from which they fire upon them, and descend not till the animals are dead.—*Voyage de Bosman*, p. 437.*

‡ At the Cape of Good Hope, the buffaloes are larger than those of Europe. Instead of being black, like the latter, they

a red colour. We are assured by Aldrovandus, and several other naturalists and travellers, that no person dare clothe himself in red, in countries frequented by the buffalo. I know not whether this aversion to fire and a red colour be general among the buffaloes; for it is only some of our oxen which are enraged at the sight of red clothes.

The buffalo, like all the large animals of warm climates, is fond of wallowing, and even of remaining in the water. He swims well, and boldly crosses the most rapid rivers. As his legs are longer than those of the ox, he runs more swiftly. The Negroes of Guinea, and the Indians of Malabar, where the buffaloes are very numerous, are fond of hunting them. They never attack these animals openly, but watch for them on the tops of trees, or lie hid in the thickets through which the buffaloes cannot pass on account of their horns. These people esteem

are of a dark red colour. Upon the front, there is a rude tuft of curled hair. Their whole body is well proportioned, and they advance their head very much forward. Their horns are very short, and hang down on the side of their neck; the tips bend inward, and nearly join. Their skin is so hard and firm, that it is difficult to kill them without a good firelock. Their flesh is neither so fat nor so tender as that of ordinary oxen. The buffalo, at the Cape, turns furious at the sight of a red garment, or upon hearing a gun discharged over him. On these occasions, he cries in a hideous manner, strikes with his feet, turns up the earth, and runs with fury against the man who has shot, or wears a red garment. Neither fire nor water can stop his course. Nothing but a high wall, or some similar obstacle, is capable of restraining him.—

Descript. de Bonne Esperance, tom. iii. chap. 11, p. 25.

the flesh of the buffalo, and draw great profits from his skin and horns, which are harder and better than those of the ox.

Buffaloes are made to fight lions and tigers in the Mogul's country. These animals are very numerous in all warm climates, especially in marshy countries, and in the neighbourhood of rivers. Water, and a moist soil, seem to be still more necessary to them than the warmth of a climate*. It is for this reason that none of them are found in Arabia, where almost the whole country is dry. The wild buffaloes are hunted, but with much caution; for they are exceedingly dangerous, and, when wounded, run against men with great fury. As to the domestic buffaloes, Niebuhr remarks, that, in some places, as at Basra, it is the practice, when milking the female, to thrust the hand, as far as the elbow, into the vagina, because this operation makes her yield a greater quantity of milk†. This fact appears not to be probable; but the female buffalo, like some of our cows, may forcibly retain her milk, and this gentle kind of titillation may relax the contraction of her teats.

At the Cape of Good Hope, the body of the buffalo is of the same size with our ox; but he has shorter legs, and a larger head. He is a very formidable animal. He frequents the borders

* I formerly remarked, that the buffaloes might succeed in France. Attempts have lately been made to propagate them in Brandenbourg, near Berlin. — *Gazette de France*, June 9, 1775.

† *Descript. de l'Arabie*, par M. Niebuhr, p. 145.

of the woods, and, as his sight is not good, he remains there with his head placed near the ground, in order the better to distinguish objects among the roots of the trees. When he perceives any disagreeable object near him, he darts suddenly upon it, making, at the same time, a most hideous bellowing; and it is very difficult on these occasions to escape his fury. He is not so much to be dreaded in the open fields. His hair is red, and black in some places. They appear often in numerous flocks*.

The animal called *empacassa*, or *pacassa*, at Congo, though very imperfectly described by travellers, appears to me to be the buffalo; and the animal mentioned under the name of *empabunga*, or *impalunca*, in the same country, is, perhaps, the bubalus, whose history shall be given along with that of the gazelles or antelopes.

* Note communicated by the Vicomte de Querhoënt to M. de Buffon.

THE MOUFLON* AND OTHER SHEEP.

THE weakest species of useful animals were first reduced to a domestic state. The sheep and goat were subjugated before the horse,

* CHARACTER SPECIFICUS †.

Ovis AMMON. O. cornibus arcuatis semicircularibus sub-
tus planiusculis, palearibus laxis pilosis. — *Linn. Syst. Nat.*
Gmel. 1. p. 200. — *Erxleben. Mamm.* p. 250.

Hircus (*Capra orientalis*) cornibus supra rotundatis, infra
planis, semicirculum referentibus. — *Briss. Quadr.* p. 71.

MUSMON ET OPHION. — *Plin. Hist. Nat.* viii. c. 49;
xxviii. c. 9 et 15.

MUSMON sive MUSIMON. — *Gesn. Quadr.* p. 934.

Ovis fera Sibirica vulgo Argali dicta. — *Pallas, Spic.* xi.
p. 3, pl. 1. *fig. inferior* maris annosi, hieme; *fig. superior*
feminae senioris, hieme; *tab. 2. fig. inferior* feminae depilis
æstate; *fig. superior* junioris; bonæ.

TRAGELAPHUS. — *Bellon, Obs.* p. 54, cum *fig. medioer.*

THE ... cornibus arctatis. — *Gmelin.*

trop. 34, p. 53, pl. 3, b. *fig. 2.* maris, *fig. 3.* feminae me-
dioer.

LE MOUFLON. — *Buff. Hist. Nat. por. Siam.* xxix. p. 238,
pl. 8.

WILD SHEEP. — *Penn. Hist. Quadr.* i. p. 44.

MOUFLON. — *Bew. Quadr.* p. 64.

ARGALI. — *Shaw's Gen. Zool.* li. p. 579, pl. 201.

† For the generic character, see vol. iv. p. 266.



MUFFLON.



ICELAND RAM.



ICELAND EWE.



BABBARY WEDDER.



INDIAN RAM.



INDIAN RAM.



INDIAN EWE.



RAM of TUNIS.



A. Bell sculpt.

MORVANT

the ox, or the camel. They were likewise more easily transported from one climate to another. From this source, all the varieties among these species, as well as the difficulty of distinguishing the genuine stock of each, have proceeded. We formerly proved, that our domestic sheep, in their present condition, could not subsist without the support of man*; from which it is apparent, that Nature never produced them as*

HABITAT

in apricis rupestribus tractus alpini Asiæ mediæ, in desertis; in Kamtschatka, insulis kurilis, forte etiam in California et America reliqua occidentali; est quoque in Barbariæ, Sardinia, Corsicæ, Graeciæ montibus altissimis, subgregaria.

W.

The Siberian goat has large horns bending back, close at their base, distant at their points, with circular rugæ. These animals vary in size and colour. The skin of the one the British Museum did me the favour of accepting, was covered with pale ferruginous hair, on the sides short, on the top of the neck longer, and a little erect. Along the lower side of the neck, and on the shoulders, the hair was fourteen inches long. Beneath the hair was a short wool. On the knees there was a bare spot, as if by kneeling to lie down. The tail was very short; and the horns were twenty-five inches long, eleven in girth in the thickest place, and one foot seven inches distant from point to point. The horns of the females are much less than those of the males. — *Penn. Synops. Quad.* p. 18.

Mouflon is derived from the Italian word *Mufone*, the name of this animal in the islands of Corsica and Sardinia; in Greek, *μωφίων*, according to Strabo; in Latin, *Musmon* or *Musmon*; in Siberia, *Stepnie, a ani*, that is, *wild sheep*, according to Gmelin; and among the Mogul Tartars, *Argali*.

* See article Sheep, vol. iv.

they exist at present, but that they have degenerated under our care. We must, therefore, search among the wild animals for those which make the nearest approach to the sheep. We must compare them with the domestic sheep of foreign countries, examine the different causes which might introduce changes into the species, or make it degenerate, and endeavour, as in the case of the ox, to recal all these varieties, and all these pretended species, to one primitive race.

Our sheep, in its present state, exists no where but in Europe, and some of the temperate provinces of Asia. When transported into warm countries, as Guinea *, it loses its wool, and is

* *Ovis Africana* pro vellere lanoso pilis brevibus hirtis vestita; hoc genus vidimus in vivario regio, Westmonasteriensi, S. Jacobi dicto; quoad formam corporis externam ovibus vulgaribus persimile, verum pro lana ei pilus fuit. . . . Specie a nostratibus differre non fidenter affirmaverim; fortasse quemadmodum homines in Nigritarum regionibus pro capillis lanam quandam obtinent; ita vice versa pecudes hæc pro lana pilos. — *Ray, Syn. Quad.* p. 75. In the kingdom of Congo, in Loango, and Cabinda, the sheep, instead of soft wool, are covered with coarse hair, similar to that of dogs. The extreme heat of the air, which dries up all the oily humours, is the cause of this coarseness. I made the same observation with regard to the Indian sheep. — *Voyage de J. Ovington*, tom. i. p. 60. The sheep are pretty numerous along the coast of Guinea, and yet they are very dear. They have the same figure with those of Europe, except that they are one half smaller, and, instead of wool, are covered with hair of an inch long. . . . The flesh has not the smallest appearance of that of the European sheep, being extremely dry, &c. — *Voyage de Bosman*, p. 237.

covered with hair: its fertility is diminished, and the taste of its flesh is altered. In very frigid countries it cannot subsist. But, in cold climates, and particularly in Iceland, we find a race of sheep with several horns, a short tail, and hard thick wool, under which, as in most northern animals, there is a layer of softer, finer, and more bushy wool. In warm countries, on the contrary, the sheep have generally short horns and a long tail, some of which are covered with wool, others with hair, and others with a mixture of wool and hair. The first of these warm country sheep, which is commonly called the *Barbary sheep**, or the *Arabian sheep*†, resembles the domestic kind in every respect, except the tail‡, which is so loaded with fat,

* Persia abounds in sheep and goats. Some of these sheep, which are called *Barbary*, or *broad-tailed sheep*, have a tail that weighs above thirty pounds. It is a heavy burden to the poor animals, and still more so, as it is narrow at the origin, and broad at the extremity. Some of them are so heavy, that the animals are unable to trail them; and the shepherds are obliged to fix boards with two wheels under the tail, to preserve it from galling, &c. — *Chardin*, tom. ii. p. 28.

† *Ovis laticauda Arabica*. — *Raii Synops. Quad.* p. 74. Most naturalists call this animal the *Arabian sheep*. It is not, however, an original native of Arabia, nor does it belong to the Arabian race of sheep. But they are very numerous in South Tartary, Persia, Egypt, Barbary, and in all the eastern coasts of Africa.

Aries laniger, cauda latissima. . . . *Ovis laticauda*. La prebis à large queue. — *Brisson. Quad.* p. 50. — *Linn. Syst. Nat.* p. 97. — *Nov. Com. Petrop.* tom. v. p. 347, tab. 8.

‡ Neque his arietibus ullum ab aliis discrimen præterquam

that it is often more than a foot broad, and weighs above twenty pounds. Besides, there is nothing remarkable in this animal but its tail, which it carries as if a cushion were fixed to its thighs. Among this race of sheep, there are some whose tails are so long* and heavy, that they are obliged to be supported by a small wheel machine, to enable the animals to walk. In the Levant, this sheep is covered with very fine wool; but, in warm countries, as Madagascar, and the Indies†, it is covered with hair. The redundance of fat, which, in our sheep, fixes about the kidneys, descends, in these animals, upon the vertebræ of the tail: the other parts of their bodies are less loaded with fat than our

in cauda quam latissimam circumferunt. . . Nonnullis libras decem aut viginti cauda pendet, cum sua sponte impinguntur; verum in Ægypto plurimi farciendis vervecibus intenti, furfure hordeoque saginant; quibus adeo crassescit cauda ut se ipsos dimovere non possint; verum qui eorum curam gerunt caudam exiguis vehiculis alligantes gradum promovere faciunt; vidi hujusmodi caudam libras octuaginta pondera re. — *Leon. Afric. Descript. Afric.* vol. ii. p. 253.

* *Ovis Arabica altera.* — *Raii Synops. Quad.* p. 74. *Aries laniger cauda longissima.* . . . *Ovis longicauda.* — *Brisson. Quad.* p. 76. *Note,* Ray and Brisson have made two distinct species of these broad and long-tailed sheep. But Linnæus has properly reduced them to one,

† The island of Madagascar produces sheep with tails so large that they weigh twenty pounds. They are loaded with fat, which does not melt, and their flesh is very delicate. The wool of these sheep is like goats' hair. — *Voyage de Flacourt*, p. 5. The flesh of the wedders and young females has an excellent savour. — *Ibid.* p. 151.

fed wedders. This variety should be attributed to the food, the climate, and the care of men; for those broad or long-tailed sheep are domestic like ours, and even require more care* and management. This race is much more diffused than that of the ordinary kind. It is common in Tartary*, Persia†, Syria‡, Egypt, Barbary, Æthiopia§, Mosambique||,

* The sheep of Tartary, like those of Persia, have large tails, which consist entirely of fat, and weigh from twenty to thirty pounds. Their ears are pendulous, and their nose flat.—*Voyage d'Olearius*, tom. i. p. 321. The sheep of East Tartary have tails which weigh from ten to twelve pounds. These tails consist of solid fat, which has an excellent relish. The bones of the vertebræ are not larger than those of our sheep.—*Relation de la Grande Tartarie*, p. 187. The sheep of Calmuck Tartary have their tails concealed in a cushion of many pounds weight.—*Id.* p. 267.

† A single tail of some of the Persian sheep weighs from ten to twelve pounds, and yields five or six pounds of fat. Its figure is the reverse of that of our sheep, being broad at the extremity, and small at the origin.—*Voyage de Tavernier*, tom. ii. p. 379.

‡ In Syria, Judea, and Egypt, the tails of the sheep are so large, that I have seen one of them weigh above thirty-three pounds, though the animals were not larger than the sheep of Berri, but much handsomer, and had finer wool.—*Voyage de Villamont*, p. 629.

§ In Æthiopia, there are sheep whose tails weigh more than twenty-five pounds. . . . Others have tails a fathom long, and twisted like a vine branch.—*Drake's Voyage*, p. 85.

|| Sunt ibi oves quæ una quarta parte abundant; integram enim ovem si quadrifide secaveris præcise quinque partibus pienarie constabit; cauda siquidem quam habent tam lata, crassa, et pinguis est, ut ob molem reliquis par sit.—*Hug. Lintscot. Navig.* part ii. p. 19.

Madagascar *, and the Cape of Good Hope † ‡.

We have given the figure of a ram which was shown at the fair of St. Germain, in the year

* The island of Madagascar abounds in cattle. . . . The tails of the rams and ewes are so large, that we saw one which weighed twenty-eight pounds. — *Voyage de Pyrard*, tom. i. p. 37.

† In the sheep at the Cape of Good Hope there is nothing remarkable, except the length and thickness of the tail, which commonly weighs from fifteen to twenty pounds. The Persian sheep, though smaller, have still larger tails. I have seen some of this race at the Cape, whose tails weighed at least thirty pounds. — *Descript. du Cap de Bonne Esperance*, par Kolbe, tom. ii. p. 97.

‡ Barrow has given an excellent figure of the sheep of Southern Africa; which he has noticed as follows.

“ The broad-tailed breed of Southern Africa seems to be of a very inferior kind to those of Siberia and Oriental Tartary: they are long legged, small in the body, remarkably thin in the fore quarters and across the ribs; have very little intestine or net fat; the whole of this animal substance being collected upon the hind part of the thigh, but particularly on the tail, which is short, broad, flat, naked on the under side, and seldom less in weight than five or six pounds; sometimes more than a dozen pounds: when melted it retains the consistence of fat vegetable oils, and in this state it is frequently used as a substitute for butter, and for making soap by boiling it with the lie of the ashes of the solsole. This species of the sheep is marked with every tint of colour; some are black, some brown, and others bay; but the greatest number are spotted: their necks are small and extended, and their ears long and pendulous: they weigh from sixty to seventy pounds each, when taken from their pasture; but on their arrival at the Cape are reduced to about forty; and they are sold to the butchers, who collect them upon the spot, for six or eight shillings a piece.”

1774, under the name of the *ram of the Cape of Good Hope*. This same ram was exhibited, the year preceding, under the denomination of the *Mogul ram with a thick tail*. But we learned that it was purchased at Tunis; and we think it is the same with the Barbary sheep formerly represented, from which it differs only by the shortness of its tail, which is also flatter, and broader in the upper part. The head is likewise proportionally thicker, and resembles that of the Indian ram. The body is well covered with wool, and the legs are short, even when compared with those of our sheep. The figure and size of the horns differ little from those of the Barbary sheep. We have called it the *ram of Tunis*, to distinguish it from the other; but we are persuaded that they both belong to the same country of Barbary, and that they are very nearly of the same race.

We have likewise given the figure of a ram, which was exhibited at the fair of St. Germain, in the year 1774, under the name of the *morvant of China*. This ram is remarkable for a kind of mane on his neck, and for long hairs which hang down from his throat, and form a kind of cravat. These hairs are a mixture of red and gray, hard to the touch, and about ten inches long. The hairs of the mane are red, not very thick, extend as far as the middle of the back, and are of the same colour and consistence with those on the throat; but they are shorter and mixed with some brown and black hairs. The wool which covers the body is a little curled, and

soft at the extremity ; but near the skin of the animal it is straight and hard : in general, it is about three inches long, and of a bright yellow colour. The legs are of a deep red, and the head is spotted with different shades of yellow. The greatest part of the tail is yellow and white, and in figure resembles that of a cow, being well furnished with hair toward the extremity. This ram stands lower on his legs than the common kinds, and he resembles the Indian ram more than any other. His belly is very large, and not above fourteen inches nine lines raised from the ground. M. de Seve, who described this animal, adds, that, from the grossness of the belly, it had the appearance of a pregnant ewe. The horns are nearly the same with those of our rams. But the hoofs are not prominent, and they are longer than those of the Indian ram.

In the islands of the Archipelago, and particularly in Crete, there is a race of domestic sheep, of which Belon has given a figure and description under the name of *strepsicheros* *. This sheep is of the same size with the common kind. Like the latter, it is covered with wool, and differs from them only by having erect horns chamfered in the form of a screw.

In fine, we find in the warmer countries of

* In Crete, and particularly on Mount Ida, there is a race of sheep, which go in large flocks, and are called *striphocheri*. They resemble the common kind in every thing but their horns, which, instead of being twisted, are straight and chamfered like a screw. — *Observ. de Belon*, p. 15.

Africa and India, a race of large sheep with coarse hair, short horns, pendulous ears, with a kind of dewlap which hangs under the neck. This sheep is called by Leo Africanus and Marmol, *adimain**, and it is known to the naturalists under the name of the *Senegal sheep*†, the *Guinea sheep*‡, the *sheep of Angola*, &c.

* *Adimain*, animal domesticum arietem forma refert. . . . Aures habet oblongas et pendulas. Lybici his animalibus pecoris vice utuntur. . . . Ego quondam juvenili fervore ductus horum animalium dorso insidens ad quartam miliarium partem delatus fui. — *Leon. Afric. Descript. Afric.* vol. ii. p. 752. — See also *l'Afrique de Marmol*, tom. i. p. 59.

† The wedders, or rather the rams of Senegal, for none of them are castrated, are a distinct and strongly marked species. They have nothing of the common kind but the head and tail. From the coarseness of their hair, they seem to be allied to the goat. . . . It appears that wool would be incommodious to the sheep in very warm climates; and that Nature has changed it into hair of moderate length, and pretty thin. — *Voyage au Senegal, par M. Adanson*, p. 35.

African sheep. . . . It is meager, very long-legged, and tall, with short horns and pendant ears. It is covered with short hair instead of wool, and has wattles on its neck. Perhaps it is the *adimain* of Leo Africanus, p. 241, which he says furnishes the Lybians with milk and cheese. It is of the size of an ass, and shaped like a ram. — *Penn. Synops. Quadr.* p. 12.

‡ *Aries Guineenses*, sive *Angolensis*. — *Marcgr.* p. 234. — *Rati. Synops. Quadr.* p. 75.

Aries Pilosus, pilis brevibus vestitus, juba longissima, auriculis longis pendulis. . . . *Ovis Guineensis*. La brebis de Guinée. — *Briss. Regn. Anim.* p. 77.

Ovis Guineensis, auribus pendulis, palearibus laxis, pilosis, occipite prominente. — *Linn. Syst. Nat.* p. 98.

Sheep of Sahara. — *Shaw's Travels*, p. 241.

Carnero, or bell wedder. — *Della Valle Trav.* p. 91.

The Guinea sheep differ from the European kind. They

It is domestic, like the other kind, and subject to the same varieties. We have given figures of two of these sheep, which, though they differ in particular characters, have so many resemblances, that we must pronounce them to belong to the same race. Of all the domestic kinds, this race appears to approach nearest to a state of nature. It is larger, stronger, nimbler, and, consequently, more capable of subsisting as a wild animal. But as it is only found in very warm climates, and cannot endure cold, and as, even in its native climate, it subsists not in a wild state, but is domestic, and requires the aid of man, it cannot be regarded as the primitive stock from which all other sheep have derived their origin.

In considering domestic sheep, therefore, relative to the order of climate, we have, 1. The northern sheep with several horns, and whose wool is extremely coarse. The sheep of Iceland, Gothland, Muscovy *, and other parts of the

are generally longer legged; and have no wool, but short, soft hair, like that of a dog. The rams have long manes, which sometimes hang down to the ground, and cover their necks, from the shoulders to their ears, which are pendulous. Their horns are knobbed, pretty short, sharp, and bended forward. These animals are fat; their flesh is good, and well flavoured, especially when they feed on the mountains or along the sea-coasts; but it smells of tallow when they pasture on marshy grounds. The ewes are exceedingly prolific. . . . They always bring forth two lambs at a time. — *Voyage de Desmarchais*, tom. i. p. 141.

* Twenty Silesian shepherds arrived at Petersburg, and were afterwards sent to Cazan to shear the sheep, and to

north of Europe, have all coarse hair, and seem to belong to the same race.

2. Our sheep, whose wool is very fine and beautiful in the mild climates of Spain and Persia, but which, in very warm countries, turns coarse. We have already remarked the conformity between the influence of the climates of Spain and of Chorazan, a province of Persia, upon the hair of goats, cats, and rabbits: it acts in the same manner upon the wool of sheep, which is very fine in Spain, and still finer in that part of Persia*.

teach the Muscovites the mode of preparing wool. . . . — But this did not succeed; and the chief cause of its failure was said to be owing to the coarseness of the wool, the sheep and goats having always intermixed and produced together. — *Nouv. Mem. sur l'Etat de la Moscovie*, tom. i. p. 290.

* At Meschet in the country of Chorazan, on the frontiers of Persia, lamb skins formerly constituted a great article of commerce. The fleeces were of a beautiful silver gray colour, all curled, and finer than silk: those sheep which come from the mountains to the south of this city, and from the province of Kerman, afford the finest wool in Persia. — *Relation de la Grande Tartarie*, p. 187. The greatest part of this fine wool is furnished by the province of Kerman, which is the ancient Caramania; and the best kind comes from the mountains adjacent to the town, which has the same name with the province. It is singular, that when the sheep of these places have eat the new herbage from January to May, the fleeces fall entirely off, and leave the animals as bare as scalded pigs; so that there is no occasion for shearing them as in France. When the fleeces are collected, they are beat or threshed; by which operation the coarser part separates and leaves nothing but the fine. . . . This wool is never dyed: it is naturally of a bright brown or a gray ash colour, and very little of it is white. — *Voyage de Tavernier*,

3. The large tailed sheep, whose wool is very fine in temperate countries, such as Persia, Syria, and Egypt; but in warmer climates, it is converted into hair more or less coarse.

4. The strepsicheros, or Cretan sheep. They resemble ours in every article but the horns, which are erect and chamfered in a spiral form.

5. The adimain, or large sheep of Senegal and India, which are covered with hair more or less short and coarse, in proportion to the heat of the climate. All these sheep are only varieties of the same species, and would unquestionably produce with each other; since we know from experience that the he-goat, whose species is more remote, produces with our ewes. But, though these five or six races of domestic sheep are all varieties of the same species, entirely produced by difference of climate, food, and management; yet none of them appears to be the primitive stock or source of all the rest. None of them is sufficiently strong or nimble to resist the carnivorous animals, or to escape from them by flight. All of them equally require care and protection. Hence the whole should be regarded as degenerate races, formed by the hand

tom. i. p. 130. The wedders of the Usbeck and Beschac Tartars have long, grayish wool, curled at the ends into small white rings, which have the appearance of pearls. These fleeces are more esteemed than the flesh; because, next to the sable, they are the most valuable furs used in Persia. The animals are fed with great care, and generally in the shade. When obliged to be exposed to the open air, they are covered like our horses. The tail of these wedders is small, like that of the common kind. — *Voyage d'Olearius*, tom. i. p. 547.

of man, and multiplied for his use. While he nourished, cultivated, and increased these domestic races, he would neglect, injure, and destroy the wild race, which, being strong and less tractable, would, of course, be more incommodious and less useful to him. The individuals of this race, therefore, would be small, and limited to such desert or thinly inhabited places as could afford them subsistence. Now, in the mountains of Greece, in the island of Cyprus, Sardinia, and Corsica, and in the deserts of Tartary, we find the animal called *mouflon*, which seems to be the primitive stock of all the different varieties of shæep. It lives in a state of nature, and subsist and multiplies without the aid of man. It resembles, more than any other wild animal, all the domestic kinds, and it is stronger, swifter, and more vivacious than any of them. It has the head, front, eyes, and face of the ram. It likewise resembles him in the figure of the horns, and in the whole habit of the body. In fine, it produces with the domestic shæep*, which alone is sufficient to prove that it belongs to the same species, and is the primitive stock from which all the other varieties have originated. The only difference between the mouflon and

* Est et in Hispania, sed maxime Corsica, non maxime assimile pecori (scilicet ovili) genus musmonum, caprino villo, quam pecoris velleri propius: quorum e genere et ovibus natos prisci umbros vocarunt. — *Plin. Hist. Nat.* lib. viii. cap. 49. From this passage we learn, that the mouflon has at all times produced with the shæep. The ancients called all the mongrel animals of this race, *umbri*, *imbri*, or *ibri*.

our sheep is, that the former is covered with hair, instead of wool. Now, we have already seen, that, in domestic sheep, wool is not an essential character, but only a production of temperate climates; since, in warm countries, these same sheep lose their wool, and are covered with hair; and in very cold regions, their wool is as coarse as hair. Hence it is by no means surprising, that the primitive wild sheep, which must have been exposed to heat and cold, and must have multiplied without shelter in the woods and deserts, should not be covered with wool, which it would soon lose among the thickets, and its nature would be changed by the continual action of the air and temperance of the seasons. Besides, when the he-goat copulates with the domestic ewe, the produce is a kind of mouflon; for the lamb is covered with hair, and is not an unfertile mule, but a mongrel, which rises up toward the primitive species, and seems to indicate that the goat and our domestic sheep have something common in their origin: and, as we know from experience, that the he-goat easily produces with the ewe, but that the ram is incapable of impregnating the she-goat, it is evident, that, among these animals, while in a domestic state, the goat is the predominant species. Thus, our sheep is a species much more degenerated than that of the goat; and it is extremely probable, that, if the she-goat were served with a mouflon, instead of a domestic ram, she would produce kids which would approach to the species of the goat, as the lambs

produced by the he-goat and ewe rise toward the original species of the ram.

I am aware of objections to this doctrine from those systematic naturalists, who found all their knowledge of natural history upon some particular characters; and, therefore, shall endeavour to prevent them. The first character, they will say, of the ram, is to carry wool, and the first character of the goat is to be covered with hair. The second character of the ram is to have horns bended in a circular form, and turned backward, and that of the he-goat is to have them straight and erect. These, they will affirm, are the essential and infallible marks by which sheep and goat will always be distinguished; for they must acknowledge, that every other article is common to both. None of them have cutting teeth in the upper jaw; but each of them has eight in the under jaw. In both, the canine teeth are wanting; their hoofs are equally divided, and their horns are simple and permanent. Both have their paps situated in the region of the belly; and both feed upon herbage. Their internal structure is still more similar; for it appears to be the very same. The number and form of their stomachs, the structure and disposition of their intestines, the substance of the flesh, the qualities of the fat and seminal liquor, the times of gestation and growth, and the duration of their lives, are exactly the same. There remain, therefore, only the wool and the horns by which these two species can be distinguished. But, it has already been shown, from facts, that wool is not so much a

natural substance, as a production of climate, aided by the care of man. The sheep of warm and of cold countries, and wild sheep, have no wool. Besides, in very mild climates, the goats may be said to have wool instead of hair; for that of the Angora goat is finer than the wool of our wedders. This character, therefore, is not essential, but purely accidental, and even equivocal; for it may equally belong to these two species, or be wanting altogether, according to the difference of the climates. That of the horns appears to be still less certain; for they vary in number, size, figure, and direction. In our domestic sheep, the rams have generally horns, and the ewes have none. I have seen sheep not only with two, but with four horns. Those of the North and of Iceland have sometimes eight. In warm countries, the rams have only two short horns, and often want them, like the ewes. In some, the horns are smooth and round; in others, they are flat and chamfered. The points, instead of being bended backward, are sometimes turned outward, forward, &c. This character, therefore, is not more constant than the former; and, consequently, it is not sufficient to constitute different species *. Neither can

* Linnæus, with great propriety, instead of six species, has made six varieties only of domestic sheep. 1. *Ovis rustica cornuta*. 2. *Anglica mutica, cauda scrotoque ad genua pendulis*. 3. *Hispanica cornuta, spira extrorsum tracta*. 4. *Polycerata e Gothlandia*. 5. *Africana pro lana, pilis brevibus hirta*. 6. *Laticauda platyura Arabica*.—Linn. Syst. Nat. p. 97. All these sheep are only varieties, to which this

the thickness or length of the tail answer this purpose; since it may be considered as an artificial member, which, by great care and abundance of good nourishment, may be enlarged at pleasure. Besides, among our domestic races, as in certain British sheep, there are some which have tails longer than the common kind. Our modern naturalists, however, trusting solely to the differences in the horns, the wool, and the largeness of the tail, have made seven or eight distinct species out of the sheep kind. The whole of these we have reduced to one. And this reduction seems to be so well founded, that there is little prospect of its being overturned by future observations.

In composing the history of wild animals, we found it convenient to examine them one by one, without any regard to genus; but, in the domestic animals, on the contrary, it was necessary not only to adopt, but to increase the number of genera; because in Nature there exist only

author should have added the *adimain*, or Guinea sheep, and the *strepsicheros* of Crete, instead of making them two different species. In the same manner, if he had seen the mouflon, and had known that it produced with the sheep, or had only consulted the passage of Pliny concerning the mouflon, he would never have ranked it with the goat, but with the sheep. Brisson has not only placed the mouflon and strepsicheros, which he calls *hircus laniger*, among the goats, but he has made four distinct species of domestic sheep covered with wool, beside the domestic sheep of warm countries covered with hair, and the broad and long-tailed sheep. All these seven we have reduced to a single species.

individuals, and successions of individuals, that is, species. Men have had no influence on independent animals; but they have greatly altered and modified the domestic kinds. We have, therefore, established physical and real genera, very different from those metaphysical and arbitrary ones, which have no existence but in idea. These physical genera are, in reality, composed of all the species, which, by our management, have been greatly variegated and changed; and, as all those species, so differently modified by the hand of man, have but one common origin in Nature, the whole genus ought to constitute but a single species. In writing, for example, the history of tigers, we have admitted as many species as are really found in different parts of the earth; because we are certain that man has never introduced any changes among these untractable and ferocious animals, who subsist at present in the same manner as they were originally produced by Nature. The same remark applies to all free and independent animals. But, in composing the history of oxen and sheep, we have reduced all the varieties of the oxen to one ox, and all the varieties of the sheep to one sheep; because it is equally certain that man, and not Nature, has produced the different kinds which we have enumerated. Every thing concurs in supporting this idea, which, though clear in itself, may not, perhaps, be sufficiently understood. That all the oxen produce together, we are assured by the experiments of M. de la Nux, Ment-

zelius, and Kalm: that all the sheep produce with one another, with the mouflon, and even with the goat, I know from my own experience. All the varieties of oxen, therefore, form but one species; and all the sheep, however numerous their varieties, constitute only another species.

I am obliged, by the importance of the subject, to repeat, that Nature is not to be judged of by particular minute characters, and that by these the differences of species are not to be determined; that methodical distributions, instead of throwing light on the history of animals, render it still more obscure, by a fruitless multiplication of denominations and of species; ~~by forming~~ arbitrary genera, which Nature never knew; by confounding real beings with creatures of imagination; by giving false ideas of the essential characteristics of species; and by mixing or separating them in an arbitrary manner, without skill, and often without having examined or even seen the individuals. It is for this reason that our nomenclators perpetually deceive themselves, and publish nearly as many errors as lines. Of this we have already given so many examples, that nothing but the blindest and most obstinate prejudice can possibly resist the evidence they afford. On this subject M. Gmelin talks very sensibly, when treating of the animal under consideration*.

* "The *argali*, or *stepnic-barani*, which occupy," says he, "the southern mountains of Siberia, from the river Irtysh, as far as Kamtschatka, are extremely vivacious animals; and this vivacity seems to exclude them from the class of sheep,

THE MOUFLON, &c.

e are convinced, as M. Gmelin remarks, that we can never acquire a knowledge of Na-

and to rank them with that of the stags. I shall here give a short description of them, from which it will appear, that neither sprightliness nor inactivity, neither the wool nor hair with which an animal is covered, neither crooked nor straight horns, neither permanent horns nor those which fall off annually, are marks sufficiently characteristic to distinguish classes. Nature loves variety; and I am persuaded, that, if we knew better how to manage our senses, they would often lead us to more essential characters, with regard to the differences of animals, than we generally derive from reason, which seldom apprehends those marks but in a superficial manner. In this animal, the external form of the head, neck, and tail, corresponds with that of the stag. His vivacity, also, as formerly remarked, is so great, that he seems to be still more wild than the stag. The individual I saw, though reputed to be only three years old, ten men durst not attack. The largest of this species are about the size of a fallow deer. The one I examined measured, from the ground to the top of the head, a Russian ell and a half in height. His length, from the root of the horns, was an ell and three quarters. The horns rise above and very near the eyes, and just before the ears. They first bend backward and then forward in a circular form. The tips turn upward and outward. The horns, from the root to the middle, are furrowed, but afterward become somewhat smoother. It is probably from the figure of the horns that the Russians have called this animal the *wild sheep*. If we can trust the natives of these provinces, his whole strength lies in his horns. They say that the rams of this species fight by striking each other with their horns; and, when any of them are knocked off, the aperture of the base is so large, that the young foxes frequently take shelter in the cavity. It is not difficult to estimate the force necessary to break off one of these horns, since they, as long as the animal lives, continue to augment both in thickness and in length; and the part of the head also from which they spring becomes always harder. It is said, that a

ture, but by a judicious use of our senses, by seeing, examining, comparing, and at the same

well grown horn, comprehending the curvatures, measures two ells in length; that it weighs between thirty and forty Russian pounds; and that, at the base, it is seven or eight inches in diameter. The horns of the one I saw were of a whitish yellow colour; but they turn browner and blacker as the animal advances in years. He carries his ears, which are pointed and tolerably large, very erect. The hoofs are divided, and the fore-legs are three quarters of an ell long, and the hind-legs still longer. When the animal stands erect on a plain, his fore-legs are always fully extended and straight, and those behind are crooked; and this curvature seems to diminish in proportion to the inequality of the ground over which he passes. On the neck there ~~are~~ some pendulous folds. The colour of the body is grayish mixed with brown. Along the back, there is a yellowish, or rather reddish line; and the same colour appears behind, on the inside of the legs, and on the belly, where it is a little paler. This colour continues from the beginning of August till the spring, at the approach of which these animals cast their hair, and become every where more red. They cast their hair a second time about the end of July. This description applies to the males. The females are always smaller; and though they have similar horns, they are smaller and thinner, and even acquire not thickness with age. The horns are nearly straight, have no furrows, and much resemble those of our castrated he-goats.

“In the internal parts, they resemble other ruminating animals: The stomach is composed of four different cavities, and the gall-bladder is considerably large. Their flesh is good, and has nearly the same taste with that of the roebuck. The fat is delicious, according to the testimony of the Kamtschatkan nations. They feed upon herbage. They couple in autumn, and bring forth one or two lambs in the spring.

“By the hair, the taste of the flesh, the figure and vivacity of this animal, it belongs to the class of the stag. By the permanent horns, it is excluded from this class. The circular

time by denying ourselves the liberty of fabricating methodical distributions, contemptible systems, in which animals are classed which the authors never saw, and knew nothing more of them than their names, which are often ambiguous, obscure, and misapplied. The false employment of these names confounds ideas in a farrago of words, and drowns truth in a torrent of error. We are likewise convinced, after examining the mouflon alive, and comparing him with Gmelin's description, that the argali is the same animal. We formerly remarked, that this animal was found in Europe, and in pretty warm countries, such as Greece*, the island of Cyprus†,

horns give it some resemblance to the sheep. It is distinguished from that animal by its vivacity and want of wool. Its hair, its abode upon high rocks, and its frequent combats, make it approach to the goats. But the crooked horns, and the want of a beard, exclude it from this class. Should we not rather regard this animal as constituting a particular class, and recognise it as the *musimon* of the ancients? In a word, it has a strong resemblance to Pliny's description of the *musimon*, and still more to that given by the learned Gesner." —*Relation d'un Voyage par Terre à Kamtschatka, par Gmelin*. This curious relation is written by a man of good sense, and much versed in natural history.

* The tragelaphus of Belon is unquestionably our mouflon; and we perceive, from his remarks, that he saw, described, and drew a figure of this animal in Greece, and that it is found in the mountains between Macedonia and Servia.

† In the island of Cyprus, there are rams denominated by the ancient Greeks, according to Strabo, *musimones*, and called by the present Italians *mufone*. Instead of wool, they are covered with hair, like that of goats: or rather their skin and hair differ little from those of the stag. Their horns resemble those of rams; but they are bent backward. They

Sardinia, and Corsica*. But it is still more numerous in the southern mountains of Siberia, under a climate rather cold than temperate, where it even appears to be larger, stronger, and more vigorous. Hence it might equally supply the north and the south: its offspring might be rendered domestic. After suffering long the hardships of this state, it would degenerate, and, according to the differences of climate and treatment, would assume relative characters, and new habits of body, which, being afterward transmitted by generation, gave rise to our domestic sheep, and all the other races formerly enumerated.

We formerly remarked, and now repeat, that the mouflon is the primeval stock of all the other sheep, and that his constitution is sufficiently robust to enable him to subsist in cold, temperate, and warm climates. The wild rams o

are as tall and as large as a middle sized stag. They run with great swiftness; but they never quit the highest and most rugged mountains. Their flesh is good and savoury. . . . The skins of these animals are dressed, and sent to Italy where they go by the name of *cordoani* or *corduani*. — *Descript. des Isles de l'Archipel. par Dapper, p. 50.*

* His in insulis (Sardinia et Corsica) nascuntur arietes qui pro lana pilum caprinum producant, quos musmones vocitant — *Strabo, lib. v.* Nuper apud nos Sardus quidam vir non illiteratus Sardiniam affirmavit abundare cervis, apris, a damis, et insuper animali quod vulgo muflonem vocant, pellem et pilis (pilis capræ, ut ab alio quodam accepi, cætera ferè ovi simile) cervo simile; cornibus aieti, non longis sed rectis circa aures reflexis, magnitudine cervi mediocris, herbis tantum vivere, in montibus asperioribus versari, cursu velocissimo, carne venationibus expedita. — *Gem. Hist. Quadr. p. 823.*

Kamtschatka, says M. Steller, have the air of a goat and the hair of a rein-deer. Their horns are so large, that some of them weigh from twenty-five to thirty pounds. Spoons and other utensils are made of them. These rams are as active and nimble as roebucks. They inhabit the precipices of the most rugged mountains. Their flesh is exceedingly delicate; but they are hunted chiefly for the sake of their furs *.

* Professor Pallas has made some very good observations respecting the argali, in his Travels into the Northern Provinces of Russia. He describes the wild sheep, called argali by the Mongols, as stronger than the deer; it weighs about ~~20 pounds~~ (800 pounds). The ram has the advantage, in this respect, on account of the horns, which, when full grown, will sometimes exceed a poud in weight (40 pounds). It stands higher than the domestic sheep, but is equally stupid, and does not differ materially in the conformation of the head. The ears of the argali are short and erect; the horns of the male grow to an amazing size, forming a spiral on both sides of the head, like those of the European ram: the tail is very short, and the hoof resembles that of the domestic sheep. In winter its hair is long and frizzled, and mixed with a quantity of wool; in the summer, on the contrary, it is short and shining. On the 2d of June, when Pallas observed these animals, very little of the winter coat remained. Their general colour was an ash gray.

The argali generally inhabit desert mountains and rocks, where they find plenty of bitter and acrid plants. The ewes drop their lambs before the snow is entirely melted: they greatly resemble young deer: they are born with the rudiments of horns, and are clothed with a soft, woolly, and frizzled hair, of a deep gray colour.

The stag is not so wild as the argali, since it is almost impossible to get near one of these animals. When they are chased, they make frequent turns from right to left; and it often happens, when in search of eminences or rocks to hide

I believe that few of the genuine mouflons now exist in Corsica. The frequent wars which happened in that island have probably accomplished their destruction. But, in the figure of their present races of sheep, we still find marks of the former existence of the mouflon. In the month of August, 1774, we saw a Corsican ram, which belonged to the duc de Vrillière. It exceeded not the size of a French sheep. It was white, low on its legs, and had long hair disposed in locks. It had four large horns, the upper two being more bulky than the under, and they had rugosities like those of the mouflon.

themselves among, that they will return on the same track, and pass close by their pursuers. They are able to sustain the chase for a long time with astonishing lightness and velocity. When running on plain ground, they never bound or skip; but they will climb rocks, and jump over them with wonderful agility. When taken very young they may be tamed, so as to drink milk and browse forrage. The soldiers, employed to defend the borders, have proved this in many instances. Pennant thinks it probable, "that the first trial of this kind gave origin, among a gentle race of mankind, to the domesticating these most useful of quadrupeds; which the rude Kamtschatkans to this moment consider only as objects of the chase, while every other part of the world enjoy their various benefits, reclaimed from a state of nature."

W.

THE AXIS*.

THIS animal being known only under the vague names of *Sardinian hind* and *stag of the ranges*, we have preserved the appellation given

* CHARACTER SPECIFICUS.

~~CERVUS~~ **AXIS.** *C. cornibus ramosis teretibus erectis, summitate bifida, corpore albo maculato.* — *Linn. Syst. Nat. Gmel.* i. p. 179. — *Erxleb. Mamm.* p. 312. — *Schreb.* p. 5, pl. 250.

AXIS. — *Plin. Hist. Nat.* viii. c. 21. — *Ray's Quadr.* p. 89.

L'AXIS. — *Buff. Hist. Nat. par Sonn.* xxix. p. 294, pl. 14 et 15.

SPECKLED DEER. — *Nieuhoff, Voy.* p. 262.

SPOTTED AXIS. — *Penn. Hist. Quadr.* i. p. 117. — *Shaw's Gen. Zool.* ii. p. 285, pl. 180.

HABITAT

ad ripas Gangés, vulgaris : in Java, Ceylona.

W.

Deer with slender trifurcated horns; the first branch near the base, and the second near the top, each pointing upwards. It is of the size of the fallow deer, of a light gray colour, and the body is beautifully marked with white spots. Along the lower part of the sides next the belly, is a line of white. The tail, which is as long as that of a fallow deer, is red above, and white beneath. — *Penn. Synops. Quadr.* p. 51.



Axis



FEMALE AXIS

to it by Belon *, which he borrowed from Pliny, both because the characters correspond with Pliny's axis, and the name has never been applied to any other quadruped; and, therefore, we are in no danger of falling into error or confusion; for a generic denomination, accompanied with an epithet derived from the climate, is not a name, but a phrase by which an animal may be confounded with others of its own genus, as the present animal with the stag, though perhaps it is different both in species and in climate. The axis is one of the small number of ruminating animals which carry horns, like those of the stag. He has the stature and swiftness of the fallow deer. But, what distinguishes him from both, he has the horns of the stag, and the figure of the fallow deer; his whole

* " In the court of this castle, there were a male and a female of a kind of *stag* or *fallow deer*, which we should never have recognised, if we had not suspected that it was the *axis* mentioned by Pliny (lib. viii. cap. 21) in the following words: *In India. . . . et feram nomine Arim, hinni pelle, pluribus candidioribusque maculis, sacram Libero Patri.* Both of them wanted horns, and, like the fallow deer, had a long tail that hung as low as the hocks, by which we knew that they were not stags; and, in fact, at first sight, we thought they were fallow deer. But, upon a closer examination we rejected this opinion. The female is smaller than the male; and their skin was variegated with round, white spots. The ground colour of the body was yellowish, and white on the belly. In this article they differ from the camelopard, for the ground colour of the camelopard is white, and the spots are reddish. Their voice is clearer than that of the stag; for, having heard them bray, we were certain that they could neither be fallow deer nor stags, and therefore believed them to be the *axis* of the ancients. — *Belon, Observ. p. 119.*

body is marked with white spots, elegantly disposed, and separate from each other; and, lastly, he is a native of warm climates*. But the hair of the stag and fallow deer is generally of a uniform colour, and they are very numerous in cold and temperate regions, as well as in warm climates.

The gentlemen of the Academy of Sciences have given a figure and a description of the internal parts of this animal†; but they have said

* This animal was in the royal menagery, under the name of the *Ganges stag*. From this denomination, as well as from the passages of Pliny and Belon, it appears that he is a native of warm countries. The testimonies of travellers, which we are about to quote, confirm this fact, and at the same time prove, that the common species of the stag is not much diffused beyond the temperate climates. "I never saw," says le Maire, "stags at Senegal with horns like those of France." *Voyage de le Maire*, p. 190. "In the peninsula of India, on this side the Ganges, there are stags whose bodies are all interspersed with white spots." — *Voyage de la Compagnie des Indes de Hollande*, tom. iv. p. 423. "At Bengal, we find stags which are spotted like tigers." — *Voyage de Laillier*, p. 54.

† The height of these binds, from the top of the back to the tail, was two feet eight inches. The neck was a foot long, and the hind-legs three feet. Their hair was of four colours; namely, yellow, white, black, and gray. It was white on the belly and on the inside of the thighs and legs. The back was a yellowish brown, and the flanks were of a dun yellow, or Isabella colour. These ground colours were variegated with white spots of different figures. Along the back were two rows of spots in a straight line; the other spots were scattered without any order. On each side of the flanks there was a white line. The neck and head were gray; the tail was all white below, black above, and the hair of it was six inches long. — *Mem. pour servir d l'Hist. des Animaux*, part ii. p. 73.

little concerning its external form, and nothing relative to its history. They have simply called it the *Sardinian hind*, probably because it was brought to the royal menagery under that name. But we have no evidence of this animal's being a native of Sardinia. It is mentioned by no author as existing wild in this island: on the contrary, we see, from the passages already quoted, that it is found in the warmest countries of Asia. Hence the denomination of *Sardinian hind* has been falsely applied: that of *Ganges stag* would have been more proper, if it had belonged to the stag species, because that part of India, through which the Ganges runs, appears to be its native country. It seems, however, to be likewise found in Barbary*, and it is probable that the spotted fallow deer of the Cape of Good Hope is the same animal ††.

* The Arabs call a species of fallow deer *Bekker-el-Wash*, which has the horns of a stag, but is not so large. Those which I saw had been taken in the mountains near Sgigata, and appeared to be of a mild and tractable disposition. The female had no horns, &c. — *Shaw's Travels*.

† We saw, at the Cape of Good Hope, a kind of spotted fallow deer, which were somewhat smaller than those of Europe. . . . Their spots were white and yellow. They always go in flocks. — *Descript. du Cap de Bonne Esperance, par Kolbe*, tom. i. p. 120.

‡ Pennant mentions a pair of large horns, which are preserved in the British Museum, of a thick and rugged appearance; they measure two feet nine inches in length, and are two feet four between tip and tip. These horns he supposes to have belonged to a large species of axis, inhabiting either Borneo or Ceylon; he founds his conjecture on the information of Mr. Lotow, who told him of a species of stag

We formerly remarked, that no species* made so near an approach to another, as the fallow deer to the stag. The axis, however, seems to form an intermediate shade between the two. It resembles the fallow deer in the size of the body, the length of the tail, and in a kind of livery which it perpetually wears: there is no essential difference but in the horns, which want brow antlers, and resemble those of the stag. The axis, therefore, may be a variety only, and not a different species from that of the fallow deer; for, though it is a native of the warmest countries of Asia, it easily subsists and multiplies in Europe. There are flocks of them in the menagery of Paris. They produce among themselves with equal facility as the fallow deer. They have never been observed, however, to intermix with the fallow deer, nor with the stags, which has led us to presume that they are not a variety either of the one or of the other, but a distinct, intermediate species. But, as no decisive experiments have been made on this subject, as no necessary means have been used to oblige these animals to join, we do not assert positively that they belong to different species.

We have already seen, under the article *Stag* and *Fallow deer*, how liable these animals are to varieties, especially in the colour of their hair.

in those islands of a reddish brown colour, and as tall as a horse. They have trifurcated horns, and are called by the Dutch, elanden, or elks. — *Penn. Hist. Quadr.* i. p. 118.

W.

* See the article *Fallow Deer*, vol. v. of this work.

The species of the fallow deer and stag, without being numerous in individuals, are very much diffused. Both are found in either continent, and both are subject to a great number of varieties, which seem to form permanent races. The white stags, whose race is very ancient, since they are mentioned by the Greeks and Romans, and the small brown stags, which we have called *Corsican stags*, are not the only varieties of this species.

In the year 1765, the duke of Richmond had in his parks a number of that species of the fallow deer, commonly known by the name of *Ganges stags*, and which I have called *axis*. Mr. Colinson assures me, that they propagated with the ordinary kind of fallow deer.

“They live spontaneously,” he remarks, “with the fallow deer, and form not separate flocks. It is more than sixty years since this species existed in England, where they had been transported before the white and black fallow deer, and even before the stag, which last, I suppose, was brought from France; because, previous to that period, there were in England only the common fallow deer, and the Scottish roebuck. But, beside this first species; we have now the axis, the black, the yellow, and the white fallow deer. The mixture of all these colours has produced most beautiful varieties*.”

In the year 1764, we had a male and female Chinese fallow deer at the menagery of Versailles.* In height, they exceeded not two feet four inches,

* Lettre de M. Colinson à M. de Buffon.

The body and tail were of a dark brown colour, and the belly and limbs of a bright yellow. The legs were short, the horns large and garnished with antlers. This species, though smaller than the common fallow deer, and even than the axis, is perhaps a variety only of the latter, though it has no white spots; but instead of these white spots, it had, in some places, large yellow hairs, which had a considerable effect upon the brown colour of the body. In fine, the colour of the female was the same as that of the male; and, it is probable, that the race might not only be perpetuated in France, but that it might even intermix with the axis, especially as both these animals are natives of the eastern regions of Asia.

In Germany, there is another race, known in that country under the name of *Brandhirtz**, and by our hunters under that of the *stag of Ardennes*. This stag is larger than the common kind, and differs from the others not only by its deeper and almost black colour, but by long hair between the shoulders and on the throat. This kind of mane and beard give him some relation, the first to the horse, and the second to the he-goat. The ancients bestowed on this stag the compound names of *hippelaphus* and *tragelaphus*. As these denominations have occasioned many critical discussions, in which the most learned

* * Alterum cervi genus, ignotius, priore majus, pinguius, tum pilo densius et colore nigrius; unde Germanis a semiusti ligni colore *Brandhirtz* nominatur: hoc in Misenæ saltibus Bœmiæ vicinis reperitur. — *Fabricius, apud Gesner, Hist. Quad.* p. 297.

naturalists by no means agree, and as Gesner *, Caius, and others, tell us that the *hippelaphus* was the rein-deer, we thought it proper here to give the reasons which induce us to think differently, and lead us to believe, that the *hippelaphus* of Aristotle is the same animal with the *tragelaphus* of Pliny, and that both these names equally denote the stag of Ardennes.

Aristotle † gives to his *hippelaphus* a kind of

* Gesn. Hist. Quad. p. 491 et 492.

† Quinetiam *hippelaphus* satis jubæ summis continet armis, qui a forma *equi et cervi, quam habet compositam, nomen accepit, quasi *equicervus* dici meruisset. . . . Tenuissimo jubæ ordine a capite ad summos arcos crinescit. Propter *equicervo* villis qui ejus gutturi, modo barbæ, dependet. Gerit cornua utrinque, excepta fœmina, . . . et pedes habet biscalcos. Magnitudo *equicervi* non dissidet a *cervo*. Gignitur apud Arachotas, ubi etiam boves sylvestres sunt, qui differunt ab urbanis, quantum inter sues urbanos et sylvestres interest. Sunt colore atro, corpore robusto, rictu leviter adunco; cornua gerunt resupinationiora. *Equicervo* cornua sunt *Capræ* proxima. — Arist. Hist. Anim. liv. ii. cap. 1. Nota, Theodore Gaza, whose Latin version we have quoted, has falsely translated *Δοῦνας capra*, instead of *caprea*. Hence the word *capræ* should be substituted for *capræ*, that is, the *roe deer*, in place of the *she-goat*. The wild oxen, here mentioned by Aristotle, appear to be buffaloes. The short description he has given of them, the climate, their resemblance to the ox, and their black colour, have made this philosopher believe that they differed not more from the domestic oxen, than the wild boar from the common hog. But, as we formerly remarked, the buffalo and ox are two distinct species. If the ancients have bestowed no particular name on the buffalo, it is because this animal was a stranger to them, because their knowledge of him was imperfect, and they regarded him as a wild ox, which differed from the domestic ox by some slight varieties only.

mane upon the neck and top of the shoulders, a beard under the throat, horns to the male, similar to those of the roebuck, and no horns to the female. He says, that the hippelaphus is as large as the stag, and is produced among the Arachotas, a people of India, where there are also wild oxen, whose bodies are very robust, their skin black, their muzzle elevated, and their horns bended more backward than those of the domestic ox. It must be acknowledged, that Aristotle's characters of the hippelaphus will apply almost equally well to the rein-deer and to the stag of Ardennes. They have both long hair upon the neck and shoulders, and likewise on the throat, which forms a kind of beard upon the gullet, and not on the chin. But the hippelaphus, which is of the size of the stag only, differs in this particular from the rein-deer, which is much larger: what appears to decide this question, is, that the rein-deer, being an animal peculiar to cold countries, never existed among the Arachotas. This country of the Arachotas is one of the provinces which Alexander overran in his expedition into India. It is situated beyond Mount Caucasus, between Persia and India. This warm country never produced rein-deer; for they cannot subsist in temperate countries, and are found only in the northern regions of both continents. The stags, on the contrary, have no particular attachment to the north; for they are very numerous both in temperate and warm climates. Hence the hippelaphus of Aristotle, which is found among the Arachotas, and in

the same countries with the buffalo, is unquestionably the stag of Ardennes, and not the rein-deer.

Now, if we compare what Pliny has said of the tragelaphus, with what Aristotle has advanced concerning the hippelaphus, and both with Nature, we will perceive that the tragelaphus is the same animal with the hippelaphus, and consequently the same with our stag of Ardennes. Pliny remarks*, that the tragelaphus belongs to the species of stag, and differs from him only by the beard and the hair, on its shoulders. These characters are positive, and can apply only to the stag of Ardennes; for Pliny, in another place, mentions the rein-deer under the name of *Alca*. He adds, that the tragelaphus is found in the neighbourhood of Phasis, which still farther agrees with the stag, and not with the rein-deer. We may, therefore, safely pronounce, that the tragelaphus of Pliny, and the hippelaphus of Aristotle, both denote the animal which we call the *stag of Ardennes*; and that the axis of Pliny is the animal commonly denominated the *Ganges stag*. Though names have no influence upon nature, the explication of them is of great use to those who study her productions.

* Eadem est specie (cervi videlicet) barba tantum, et armorum villo distans quem *tragelaphon* vocant, non alibi quam juxta Phasin amnem; nascens. — *Plin. Hist. Nat. lib. viii. c. 33.*

THE ZEBU, OR DWARF OX*.

THIS small ox was mentioned under the article Buffalo. But as, since that article was printed, a zebu has been brought to the royal menagery, we are now in a condition to speak of it with more certainty, and to give a figure of it

* The zebu from which the following description was taken, was not larger than a calf of five weeks old. We knew it, however, to be an adult, and at least seven or eight years of age, by inspection of its teeth. It arrived at the menagery of Versailles in the month of August, 1761, and its horns were then as large as they are now in the year 1763. They are five inches three lines long, and four inches three lines in circumference at the base. They are black at the points, and in every other respect resemble those of the common ox. It has a bunch on the withers four inches and a half high, and its circumference at the base is sixteen inches. In other articles, it differs not in figure from our ox, except that its legs and feet are proportionally smaller, and its ears longer.

The tuft of hair above the coronet is black. The legs and upper part of the tail are yellowish. The under part, and the long hairs at the point of the tail, are white, and a foot in length. The rest of the body is variegated with black and brown spots, of different dimensions, and slightly tinged with a reddish colour.

“ Dwarf ox, with horns almost close at their base, broad and flat at the beginning, receding in the middle, and standing erect. It is larger than a roebuck, less than a stag, and



ZEBU.

drawn from the life, with a more perfect description than the former one. I have also learned, from fresh inquiries, that the zebu is probably the same animal which is called the *lant* *, or *dant* †, in Numidia, and several other northern provinces of Africa, where it is very common; and that the name *dant*, which solely pertains to the animal under consideration, has been transported from Africa to America, and given to an

compact, and well made in all its limbs. Its hair is shining, and of a tawny colour. Its legs are short, neck thick, and shoulders a little elevated. The tail is terminated with long hairs, twice as coarse as those of a horse. It is only a variety of the Indian ox." — *Penn. Synops. Quadr.* p. 9.

Un moult beau petit bœuf d'Afrique. — *Belon*, p. 119.

Bos cornibus aure brevioribus, dorso gibbo, juba nulla. — *Linn. Syst. Nat.* p. 99.

* *Lant* bovem similitudine refert, minor tamen cruribus et cornibus elegantius; colorem album gerit, unguibus nigrimis; tantæque velocitatis ut a reliquis animalibus, præterquam ab equo Barbarico, superari nequeat. Facilius æstate capitur quod arenæ æstu cursus velocitate ungues dimoveantur, quo dolore affectus cursum remittit, &c. — *Leonis Afric. Africa Descript.* vol. ii. p. 75.

† The *dant*, which the Africans call *lant*, is the figure of a small ox, but its legs are short. It has small horns, which bend round, and are smooth. Its hair is white, and its hoofs are black and clean. It is said to be no animal, unless the Barbary horse can overtake it. These animals are said to be more easily drawn than horses, because by the force of running, their hoofs are worn among the burning sands, and the pain occasioned by this circumstance makes them stop short, like the stags and fallow deer of these deserts. There are numbers of these *dants* in the deserts of Numidia and Lybia, and particularly in the country of the Morabitains. Of their skins the natives make excellent shields, the best of which are proof against arrows,

animal which has no resemblance to the former but in the size of its body, and belongs to a very different species. This American dant is the tapir, or the maipouri; and, to prevent the African dant, which is our zebu, from being confounded with the tapir, we shall give the history of the latter in the subsequent article.



TAPIR.

T H E T A P I R *.

THIS is the largest animal of the New World, where, as formerly remarked, animated Nature seems to be contracted, or rather not to have

* TAPIR.

CHARACTER GENERICUS †.

Dentes primores in utraque maxilla sex.

Laniarii in utraque maxilla duo.

Molares superiores utrinque septem ; *inferiores* sex.

Pedes unguis tribus, *anticis ungula succenturiata*.

† Dr. Shaw, speaking of the generic character of the tapir, as he has given it in his General Zoology, says, "In the Gmelinian edition of the *Systema Naturæ*, the generic characters of the animal are somewhat differently given; the canine teeth being said to be wanting; but I think we may depend on the description of the teeth by M. Bajon, published in the *Memoirs of the French Academy*." The fact is, that Marcgrave's account of this animal (which was for a considerable time the only tolerable one extant), has been implicitly followed till lately, when the French naturalist, Geoffroy, exactly ascertained the number of teeth in the tapir, and has since been followed by Cuvier, upon whose respectable authority I have drawn up the generic character as it now stands. I must observe that Cuvier's memoir on the tapir, did not appear till after Dr. Shaw had published his second volume of the General Zoology.

W.

had time sufficient to acquire her full dimensions. Instead of the huge masses produced by the ancient lands of Asia, instead of the ele-

CHARACTER SPECIFICUS.

TAPIR AMERICANUS. — *Linn. Syst. Nat. Gmel.* p. 216.

HIPPOTAMUS TERRESTRIS. H. pedibus posticis trisulcis. — *Linn. Syst. Nat. edit. 10,* p. 74.

SUS AQUATICUS MUSTICULUS. — *Ferm. Surin.* ii. p. 80. — *Bar. Fr. Eq.* p. 160.

TAPIRETE. — *Marcgr. Bras.* p. 229. — *Ray's Quadr.* p. 126.

DANTA. — *Nieremb. Hist. Nat.* p. 187. — *Johnst. Quadr.* p. 216.

HYDROCHÆRUS TAPIR. — *Erxleb. Mamm.* p. 191.

LE TAPIR OU MANIPOURIS. — *Briss. An.* p. 119.

LE TAPIR DU L'ANTA. — *Buff. Hist. Nat. par Sonn.* xxix. p. 303, pl. 14.

TAPIR. — *Penn. Hist. Quadr.* i. p. 163, pl. 33.

TAPIR. — *Shaw's Gen. Zool.* ii. p. 449, pl. 220.

HABITAT

in Sylvis et fluviis regionum orientalium Americæ australis ab isthmo Darien usque ad Amazonum fluvium. Gregarius.

W.

The tapir has the fore hoofs divided into four, and the hind hoofs into three parts. The nose extends far beyond the under jaw, is slender, and forms a sort of proboscis; it is capable of being contracted or extended at pleasure, and its sides are sulcated. The extremities of both jaws end in a point, and there are ten cutting teeth in each. Between them and the grinders, there is vacant space, and there are ten grinders in each jaw. The ears are erect, the eyes small, and the body shaped like a hog. The back is arched, the legs short, and the hoofs small, black, and hollow. The tail is very small. The animal grows to the size of a heifer of half a year old. The hair is short; when young, it is spotted with white, when old, it is of a dusky colour. — *Penn. Synops. Quadr.* n. 82.

Tapir is the Brazilian name of this animal.

phant, rhinoceros, hippopotamus, camelopard, and camel, all the creatures of these new lands are modelled upon a small scale. The tapirs, the lamas, the paco's, and the cabiais are twenty times smaller than the animals of the Old World to which they should respectively be compared. Here matter is not only used with a niggardly hand, but even forms are imperfect, and seem to have failed, or been neglected. Almost the whole animals of South America, which alone can be regarded as peculiar to the New World, have neither tusks, horns, nor tails. Their figure is awkward; their bodies and members are ill proportioned; and some of them, as the ant-eaters, the sloth, &c., are so miserably formed, that they have hardly the powers of moving, or of eating their food. With much difficulty they drag out a painful and languishing life in the solitudes of the desert, and cannot subsist in inhabited regions, where man and the stronger animals would soon destroy them.

The tapir is of the size of a small cow, or zebu; but has neither horns nor tail. His legs are short, and his body arched. When young, he is spotted like the stag; and afterwards his hair becomes of an uniform deep brown colour. His head is large, and terminates like that of the rhinoceros, in a long trunk. He has ten cutting teeth and an equal number of grinders in each jaw, a character which separates him entirely from the ox kind, and from all other ruminating animals. As we have only some skins of this animal. and a drawing sent us by M. Con-

damine, we cannot do better than transcribe the descriptions of him made from the life by Marcgrave* and Barrere, subjoining at the same

* *Tepiierete* Brasiliensibus, Lusitanis *anta*. Animal quadrupes, magnitudine juvenci semestris; figura corporis quodammodo ad porcum accedens, capite etiam tali, verum crassiori, oblongo, superius in acumen desinente; promuscide super os prominente, quam validissimo nervo contrahere et extendere potest; in promuscide autem sunt fissuræ oblongæ; inferior oris pars est brevior superiore. Maxillæ ambæ antè fastigiatae, et in qualibet decem dentes incisores superne et inferne; hinc per certum spatium utraque maxilla caret dentibus, sequuntur dein molares grandes omnes, in quolibet latere quinque, ita ut haberet viginti molares et viginti incisores. Oculos habet parvos porcinos, aures obrotundas, majusculas, quas versus anteriora surrigit. Crura vix longiora porcinis, et crassiuscula; in anterioribus pedibus quatuor ungulas, in posterioribus tres; media inter eas major est in omnibus pedibus; in prioribus pedibus tribus, quarta parvula exterius est adjuncta: sunt autem ungulae nigricantes, non solidæ sed cavæ, et quæ detrahi possunt. Caret cauda, et ejus loco processum habet nudum pilis, conicum, parvum more *cutian* (agouti). Mas membrum genitale longe exserere potest, instar cercopitheci: incedit dorso incurvato ut *capybara* (cabiari). Cutem solidam habet instar alcis, pilos breves. Color pilorum in junioribus est umbræ lucidæ, maculis variegatus albicantibus ut capreolus; in adultis fuscus sive nigricans sine maculis. Animal interdum dormit in opacis silvis latitans. Noctu aut mane egreditur pabuli causa. Optime potest natare. Vescitur gramine, arundine saccharifera, brassica, &c. Caro ejus comeditur, sed ingrati saporis est. — *Marcgr. Hist. Brasil.* p. 229. The *tapir* or *maypouri* is an amphibious animal, being oftener in the water than on the land, to which he resorts from time to time, in order to browse the more tender herbage. His hair is very short, and interspersed with black and white bands, which extend from the head to the tail. He makes a kind of hissing or whistling noise; and seems to partake a little both of the mule and the

time what has been said concerning him by travellers and historians. The tapir seems to be a gloomy, melancholy animal*. He comes abroad in the night only, and delights in the water, where he dwells oftener than on the land. He lives in the marshes, and° never wanders to any great distance from the margins of rivers and lakes. When alarmed, pursued, or wounded, he plunges into the water†, remains long under it, and passes over a considerable space before he makes his appearance. These habits,

hog. We find *manipouris*, as they are called by some people, in the river Ouyapok. His flesh is coarse and ill tasted. *Barrere, Hist. Nat. de la France Equin.* p. 160.

* *Tapiterte*, bestia iners et socors apparet, adeoque lucifuga ut in densis mediterraneis silvis interdum dormire amet: ita ut, si detur animal aliquod, quod noctu tantum nunquam vero de die venetur, hæc sane est Brasiliensis bestia, &c. *Hist. Nat. Brasil*, p. 101. During the day, the anta browses herbage, and, in the night, he eats a kind of clay found in the marshes, to which he retires when the sun sets. The antas are hunted during the night, and it is not a difficult business. These animals are hunted in their retreats, where they assemble spontaneously in flocks; and as soon as they approach, the hunters run up to them with burning torches with which they are so dazzled and confounded, that they overturn one another, &c. — *Hist. du Paragui, par le P. Charlevoix*, tom. i. p. 33. . . . The antas conceal themselves during the day in their dens, and come out in the night to feed. — *Descript. des Indes Occidentales, par Herrera*, p. 251.

† The manipouri is a kind of wild mule. We shot at one, but did not kill him. Unless the ball or arrow pierce his flanks, he generally escapes, particularly when water is near; for he instantly plunges into it, and quickly gains the opposite bank. — *Lettres Edifiantes, recueil xxiv. Lettre du P. Fauche.*

which he possesses in common with the hippopotamus, have induced some naturalists to suppose that he belongs to the same species*. But these animals are as remote from each other in their natures, as the countries they inhabit. To be ascertained of this fact, we have only to compare the above descriptions with that we have given of the hippopotamus. Though both inhabit the water, the tapir does not feed upon fishes; and, though his mouth is armed with twenty sharp cutting teeth†, he is not carnivorous. He lives upon plants and roots, and never uses his weapons against other animals. His disposition is so mild and timid, that he declines all hostilities, and flies from every danger. Though his legs are short and his body heavy, he runs very swiftly, and he swims still better than he runs. The texture of his skin‡ is so close and firm, that it often resists a musket ball. His flesh is coarse and insipid; but it is eaten by the Indians§. He is found in Brasil, in Para-

* Hippopotamus amphibius pedibus quadrilobis; habitat in Nilo. . . . Hippopotamus terrestris pedibus posticis trisulcis. Tapiierete habitat in Brasilia. — *Linn. Syst. Nat.* p. 74.

† Though the tapiroussou has sharp teeth, his only defence is flight, and he is by no means dangerous. The savages kill him with arrows, or entrap him with snares. — *Voyage de Lery*, p. 152.

‡ The tapiroussou is in great request among the savages, on account of his skin; for, after drying it, they cut it into round shields as large as the bottom of a ton. . . . This skin, when dried, is so hard, that I believe no arrow can pierce it. — *Idem*.

§ The flesh of the manipouri is coarse, and has a disagreeable taste. — *Lettres Edifiantes, recueil* xxiv. p. 347.

guay, in Guiana, in the country of the Amazons *, and throughout all South America, from the extremity of Chili to New Spain.

This animal, which is considered as the elephant of the New World, represents it, nevertheless, but very imperfectly in shape, and still less in size: it will be easy to make an exact comparison by examining the figures we have given of both.

We see that the kind of trunk, which it carries at the end of its nose, is but the vestige, or rudiment of that of the elephant: it is the only point of conformation by which we can say that the tapir resembles the elephant. M. de la Borde, physician to the king of Cayenne, who successfully cultivates the different branches of natural history, writes me that the tapir is the largest of all the quadrupeds of South America, and that they occasionally weigh five hundred pounds: now this weight is ten times less than that of a common sized elephant, and they can never think of comparing two animals so disproportionate, if the tapir, independent of this kind of trunk, does not resemble the elephant in some other respects. It lives, like ~~the~~ elephant, on

* In the environs of the river of the Amazons, we find an animal called *danta*. It is of the size of a mule, which it resembles in colour and the figure of its body. — *Relation de la Riviere des Amazones, par Christ. d'Acuna*, tom. ii. p. 177. The elk, which is found in some of the woods near Quito, is not rare in the Amazon woods, nor in those of Guiana. I here give the name of *elk* to the animal which the Spaniards and Portuguese call the *danta*. — *Voyage de la Riviere des Amazones, par M. de la Condamine*, p. 163.

grass, and the leaves of shrubs; it very often goes into the water to bathe, but not to catch fish, which it never eats: it produces only one young at a time.

These animals also avoid inhabited places, living in the neighbourhood of marshes and of rivers, which they often cross both during the day, and in the night. The female is followed by her little one, which is soon accustomed to enter the water, where it dives and plays before its mother, who seems to instruct it in this exercise. The father takes no part in the education, for we always find the males alone, except when the females are in season.

Tapirs are common in the interior of Guiana, and they are from time to time seen in the woods at some distance from Cayenne. When pursued, they retire to the water, where it is easy to shoot them; but, although they are naturally of a gentle disposition, they become dangerous when wounded, having been seen to throw themselves upon the boat from whence the shot came, and try to be revenged by overturning it. It is also necessary to guard against them in the forests, where they make paths, or rather large beaten roads, by their frequent going and coming, for they are in the constant habit of passing and repassing by the same places; and it is dreadful to meet them on these roads, as they move briskly, and never turn aside*; so that,

Sonnini tells us of a traveller who had nearly lost his life from his ignorance of this fact. He had slung his hamoc

without intending to do mischief, they rudely throw down all before them. The districts near the source of the rivers of Guiana are inhabited by a considerable number of tapirs, and the banks of the water are intersected by their paths: these roads are so beaten, that the most desert places appear, at first sight, to be peopled and frequented by mankind. Dogs are trained to hunt these animals on land, and also to follow them into the water: but, as their skin is very thick and firm, they are seldom killed by the first shot.

The only noise which the tapirs are able to make is a quick and sharp whistle, which the hunters and savages can imitate sufficiently well to get near enough to shoot them: they are scarcely ever seen to wander from their own proper districts. They run slowly and heavily; they attack neither men nor animals, unless dogs, approach too near, for in that case, they will defend themselves with their teeth, and kill them.

The female tapir appears to be very careful of its young: she not only teaches it to swim, play, and dive in the water, but also makes it her

between two trees, across a road frequented by tapirs. About nine or ten o'clock at night, he heard a great noise in the forest, occasioned by a tapir, who was coming so quickly towards him, that he had only time to throw himself from his hamoc, and cling to a tree. The animal did not stop, but tossed the hamoc to the branches, and bruised the man; after which, without turning from the beaten path, he passed through the midst of several Negroes, who were sleeping on the ground near a great fire, without injuring any of them.

constant companion on land: if the little one remains behind, she repeatedly turns back her trunk (in which the olfactory organ is situated) to smell if it follows, or is too far distant, and if this is the case, she calls to it, and waits to put it in the way.

Several have been brought up in a domestic state in Cayenne, without being at all mischievous: they eat bread, cassava, and fruits: they are fond of those who caress them; are grossly familiar; and have a stupid and heavy look, like that of the hog. They sometimes spend the day in the wood, and in the evening return to the house: nevertheless, it often happens, that, when they are allowed this liberty, they abuse it, and never return again. Their flesh is eaten, but it is not good; being heavy, and like that of the stag, both in colour and smell. The only parts that are tolerable, are the feet and the back of the neck.

The tapir, far from being amphibious, as many naturalists have maintained, lives continually on the surface of the ground, and always on hills, and in the driest places. It certainly frequents marshy places, but only in quest of food, as it finds there a greater quantity of vegetables than on more elevated spots. As it makes itself very dirty in the low grounds, it goes every morning and evening across some river, or washes itself in a lake. Notwithstanding its clumsy appearance, the tapir swims extremely well, and dives most readily; but cannot continue under water longer than any other terrestrial quadruped, and is ob-

liged every now and then to put out its trunk in order to respire. When pursued by dogs, it runs, if possible, to some river, which it crosses, and thus eludes their pursuit.

It does not eat fish; its only nourishment being vegetables, and especially the young shoots of plants, and such fruit as it finds under the trees. It wanders chiefly by night, except in dull rainy weather, when it appears by day. It has a fine sense of seeing and hearing, and flies on the slightest alarm, making a great noise in the woods. This solitary, gentle, and timid animal, never attempts to defend itself against man, but will stoutly resist the attacks of dogs, especially after it is wounded, and often kills them, either by biting or treading them under foot. When domesticated, it appears to be susceptible of attachment. M. Bajon kept one of these animals, which had been taken young, and which was not at that time larger than a sheep, though it afterwards grew to a great size. It became strongly attached to its master; it distinguished him in the midst of many other persons, and followed him like a dog, licking his hands, and appearing to be ~~much~~ pleased with his caresses: in short, it went alone into the woods, often to a great distance, and never failed to return again at an early hour every evening. We have seen another equally tame, in the streets of Cayenne, which used to go into the country at perfect liberty, and return every evening; nevertheless, when it was shipped

to be brought to Europe, the people on board could not retain it. The tapir broke the strong cords with which it was tied, threw itself into the water, gained the shore, and entered a thicket of mangroves at a considerable distance from the town. It was supposed to be lost, but returned the same evening to its usual quarters. As it was determined to reimbarc the animal, great precautions were taken; but they succeeded only for a certain time; for about midway between America and France, a storm arising, the animal became again outrageous, broke its bonds, and, rushing from the place of its confinement, threw itself into the sea, and was lost *.

* The tapir is a solitary animal, and generally goes alone, or at most in company with another. It hides itself during the day, in the darkest thickets, and only leaves its retreat in the night to wander in the neighbourhood, in search of water-melons and pasturage. When taken young, it immediately becomes tame, and will suffer itself to be touched, scratched, or driven from place to place, without attempting to bite. D'Azara, who made his observations in Paraguay, from the living animal, says, that it drinks like a hog, and, when domesticated, feeds on flesh raw or cooked, and on almost every thing it meets with: it is even more gluttonous than a hog, and seems not to have taste enough to distinguish one thing from another. The female brings forth in November, and has the entire care of the young one. It is very quick sighted, and sees well in the dark. The tapir is hunted with dogs, in the night time, and is frequently found in the water-melon grounds: when driven to extremity, and unable to escape, it will defend itself with its feet, and seize the dogs with its teeth. These remarks are valuable, as they were made by an actual observer of established credit. Buffon

trusted too much to Marcgrave and Barrère, the latter of whom is wrong in making the tapir more of an aquatic than a terrestrial animal. Charlevoix makes the tapir browse in the day time and retire at sun-set: this is a mistake, as the animal constantly hides itself during the day: nor is it ever hunted with burning torches, as that author asserts.

THE ZEBRA*.

WHETHER we consider symmetry of shape, or beauty of colours, the zebra is perhaps the most elegant of all quadrupeds. In this animal,

* CHARACTER SPECIFICUS †.

EQUUS ZEBRA. E. pedibus solidungulis, dilute fuscus, fasciis fuscis. — *Linæ. Syst. Nat. Gmel.* i. p. 213.

EQUUS (Zebra) fasciis fuscis transversis. — *Erxleb. Mamm.* p. 216.

EQUUS (Zebra) auriculis brevibus erectis, juba brevi, lineis transversis vesicolor. — *Briss. Regn. Anim.* p. 101.

ZEBRA INDICA. — *Aldrov. solid.* p. 416, fig. p. 417, mala. — *Jonst. Quadr.* p. 21, fig. 5. mala.

EQUUS BRASILIENSIS. — *Jacob. Mus. Reg.* p. 3, t. 2, fig. 1. — *Laur. Mus. Itæg.* t. 3, fig. 18.

LE ZEBRE. — *Buff. Hist. Nat. par Sonn.* xxix. p. 346, pl. 17, 18, 19.

WILD ASS. — *Kolben's Cape of Good Hope*, ii. p. 112.

ZEBRA. — *Edw. Glean.* pl. 222, 223. — *Penn. Hist. Quadr.* i. p. 13. — *Shaw's Gen. Zool.* ii. p. 438, pl. 217.

HABITAT

in Africa meridionali parte, precipue ad promontorium bonæ spei. W.

† For the generic character, see Horse.



ZEBRA.



A. Bell & Co. sculp.

ZEBRA.

the figure and gracefulness of the horse are united with the nimbleness of the stag. His robe is adorned with black and white belts or ribands, alternately disposed, with such regularity and exact proportion, that Nature seems here to have employed the rule and the compass. These alternate bands of black and white are the more singular, because they are straight, parallel, and as nicely separated as those of a striped stuff. Besides, they extend not only over the body, but the head, thighs, legs, and even the ears and tail; so that, at a distance, the whole body of the animal has the appearance of being artificially adorned, in the most elegant manner, with ribands. In the female these bands are alternately black and white, and black and yellow in the male. The shades are always lively and brilliant; and the hair is short, close, and fine, the lustre of which augments the beauty of the colours. The zebra, in general, is smaller than the horse, and larger than the ass. Though he has often been compared to these two animals, under the names of the *wild horse**, and *striped ass*†, he is not a copy of either.

The zebra has a short erect mane; the tail is furnished with long hairs at the end; and the whole body is beautifully striped, from the back to the belly, with lines of brown, on a very pale buff ground. It is the most elegant of all quadrupeds. — *Penn. Synops. Quadr.* p. 2.

It is called *Zebra*, *Zevera*, and *Sebra*, in Congo; and, according to Pyrard, *Esere* in Angola.

* *Equus ferus* generis suo; zebra. — *Klein. de Quadr.* p. 5.

† Infortunatum animal, quod tam pulchris coloribus præditum, *asini* nomen in Europa ferre cogatur. Vide Ludolphi Comment. p. 150. Ibique zebrae figuram.

should rather be regarded as their model; if in Nature every species were not equally original, and had not an equal right to creation.

The zebra, therefore, is neither a horse nor an ass; for, though, it has often been attempted, we never learned that they internixed and produced together. She-asses in season were presented to the zebra which was in the menagery of Versailles in the year 1761. He disdained them, or rather discovered no emotion. He however sported with them, and even mounted them, but without discovering any desire, or external sign. This coldness could be attributed to no other cause than an unsuitableness in the natures of the two animals; for the zebra was four years of age, and, in every other exercise, was sprightly and vigorous.

The zebra is not the animal mentioned by the ancients under the name of *onager*. In the Levant, in the eastern parts of Asia, and in the north of Africa, there is a fine race of asses, which, like the most beautiful horses, originated in Arabia *. This race differs from the common kind by the largeness of their body, the nimbleness of their limbs, and the lustre of their hair. They are of one uniform colour, which is a

* In Persia there are two kinds of asses; those belonging to the country, which, like ours, are slow and stupid, and used for carrying burdens only; and the Arabian asses, which are extremely handsome, and the most excellent of the species. They have smooth hair, a high head, and nimble limbs. They are used solely for riding. . . . Like horses they are trained, to amble; and their motion is extremely soft, and so fleet, that it requires a gallop to keep up with them. — *Voyage de Chardin*, tom. ii. p. 27. — *Voyage de Tavernier*, tom. ii. p. 20.

beautiful mouse-gray, with a black cross on the back and shoulders. Sometimes their colour is a brighter gray with a whitish cross*. These African and Asiatic asses†, though more beautiful than those of Europe, proceed equally from the *onagri* or *wild asses*, which are still nume-

* At Bassora, I saw a wild ass. Its figure differed not from that of the domestic kind; but its colour was brighter, and, from the head to the tail, there was a band of whitish hair. . . . In running, and in every other motion, it seemed to be much more nimble than the common kind.—*Voyage de Pietra della Valle*, tom. viii. p. 49.

† The Moors, who come to Cape Verd to traffic, carry their baggage and wares upon asses. These animals were so beautiful and so smooth skinned, that it was with difficulty I could recognise them to be asses. Those of Europe, I imagine, would be in the same condition, if their labour and the manner in which they are loaded, did not greatly disfigure them. Their hair was of a beautiful, shining, mouse-gray colour, upon which the black band along the back and across the shoulders had a fine effect. These asses are a little larger than ours. Their head, however, is easily distinguishable from that of the horse, especially the Barbary horse, which is a native of this country, and of a still higher stature.—*Voyage au Senegal par M. Adanson*, p. 118. There are great numbers of wild asses in the deserts of Numidia and Lybia, and the adjacent country. They are so fleet, that the Barbary horses alone are able to overtake them in the course. As soon as they see a man, they stop, fling up their heels, and cry; and, when he is near, they run off. They are taken by various kinds of snares. They go in troops to pasture and to drink. Their flesh is very good; but it must be allowed to cool two days after being roasted, on account of its strong smell. We have seen a number of these animals in Sardinia; but they were smaller.—*L'Afrique de Marmol*, tom. i. p. 53. •

rous in South and East Tartary*, in Persia, Syria, the islands of the Archipelago, and in Mauritania†. The onagers differ from the domestic asses by those qualities only which result from freedom and independence: they are stronger and more nimble, and they have more courage and vivacity. The figure of their bodies is the same, though the hair is longer. This difference depends likewise on their condition; for our asses would have hair equally long, if they were not shorn at the age of four or five months. The hair of a colt is at first nearly as long as that of a young bear. The skin of the wild ass is equally hard as that of the domestic kind, and we are assured that it is full of small tubercles. The chagrin brought from the Levant, which we employ for various purposes, is said to be made of the wild ass's skin.

But neither the onager, nor the fine asses of Arabia, can be regarded as the origin of the zebra species, though they resemble it in figure and swiftness. None of them exhibit that regular variety of colours, by which the zebra is so ~~eminently~~ distinguished. This beautiful species is singular, and very remote from all other kinds.

* The animal which the Mogul Tartars call *czigithai*, and which Messerschmid has denominated *mulus facundus Dauricus*, is the same with the *onager*, or *wild ass*.

† We find many wild asses in the islands of Peñe, and of Levata or Lebinthos. . . . They are also found in the island of Cythera, now called Cerigo. — *Descript. des Isles de l'Archipel*, par Dapper, p. 185, 378.

It likewise belongs to a different climate from that of the onager, being only found in the eastern and southern regions of Africa, from *Æthiopia* to the Cape of Good Hope*, and from thence as far as Congo†. He exists not in Eu-

* At the Cape of Good Hope there are numbers of wild horses, which are the most beautiful in the world. They are finely striped with black and white bands, and are very difficult to tame. — *Relat. du Chevalier de Chaumont*, p. 12. The wild ass of the Cape is one of the most beautiful animals I have ever seen. He is of the size of an ordinary saddle horse. His limbs are slender, and well proportioned, and his hair is soft and close. From the mane to the tail, a black band runs along the back, from which numbers of other bands of *different colours* proceed, and form circles by meeting under the belly. Some of these circles are white, others yellow, and others chesnut; and their various shades run into each other in such a manner as charms the eye of the spectator. His head and ears are also adorned with small bands of the same colours. Those on the mane and tail are mostly white, chesnut, or brown, and few of them yellow. He is so fleet, that no horse in the world can be compared to him. Hence it is extremely difficult to catch him, and, when caught, he sells very dear. . . . I have often seen large troops of these animals. Father Tellez, Thevenot, and other authors, assert, that they have seen them tamed; but I never heard of their being tamed at the Cape. Several Europeans have ineffectually exerted all their skill and industry to accomplish this end. — *Descript. du Cap de Bonne Esperance, par Kolbe*, tom. iii. p. 25.

† At Pamba, in the kingdom of Congo, we find an animal called *zebre* by the natives, which exactly resembles a mule, except that it is prolific. Besides, its hair is wonderfully disposed; for, from the spine of the back to the belly, there are bands, of white, black, and yellow, about three inches broad, and arranged with the nicest proportion. These ani-

rope, Asia, America, nor in any of the northern parts of Africa. Those mentioned by some voyagers* to have been found in Brasil, had been transported thither from Africa. Others, which

mals multiply greatly in this country; for they produce every year. They are extremely fleet and wild. If tamed, they might supply the place of the horse.—*Drake's Voyage*, p. 106. On the road to Loanda, in the kingdom of Congo, there is an animal of the size and strength of a mule; but its hair is variegated with white, black, and yellow bands, which encircle the body from the spine of the back to the belly, and are so beautiful, and so regularly disposed, that they have the appearance of being drawn by a pencil. It is named zebra.—*Relat. d'un Voyage de Congo, par les P. P. Michel-Ange de Gulline et Denys de Charly, Capucins*, p. 76. In Congo, there is an animal called zebra, which every way resembles a mule, except in its power of producing. Its hair is very singular: from the ridge of the back to the belly, there are three bands of different colours, &c.—*Voyage de la Compagnie des Indes de Hollande*, tom. iv. p. 320.

* When I arrived in Brasil, I saw two very rare animals, which were of the figure and size of a small mule; yet they are not mules; for they are fertile. The skin is extremely beautiful, very smooth, short, and shining like velvet. The hair is disposed into fine white and black bands, which run in the most exact proportion over the whole body, ears, tail, and other extremities. Moreover, these animals are very fierce, and never can be fully tamed. They are called, in the country from which they are brought, *esures*. They are natives of Angola in Africa, from whence they were transported to Brasil, in order to be afterwards presented to the king of Spain. Though they had been taken when very young, and were a little tamed, nobody durst approach them, except their keeper. Some time before I arrived, one of them had broke loose, and killed a groom. . . . Though tied up very close, the keeper showed me several bites he had received

have been seen in Persia* and in Turkey †, had been brought to these countries from Æthiopia. In fine, almost all those we have seen in Europe came from the Cape of Good Hope. This point of Africa is their native climate, where they are very numerous, and where the Dutch have exerted every effort to tame and render them domestic; but they have not hitherto been able fully to accomplish this purpose. The zebra, which was the subject of our description, was extremely wild when he arrived at the royal menagery, and is not yet entirely tamed.

from them. The skin of the animal is extremely beautiful.—*Voyage de Pyrard*, tom. ii. p. 376.

* The ambassadors from Æthiopia to the Mogul, must give a present of a kind of mule, whose skin I was shown as a great variety. No tiger is so finely marked, no silken stuff is striped with such variety, order, and proportion, as the skin of this animal.—*Hist. de la Revolution du Mogol*, par Fr. Bernier, tom. i. p. 181.

† An ambassador from Æthiopia arrived at Cairo with presents for the grand seignior. Among others, there was an ass that had a most beautiful skin, provided it was natural, of which I am uncertain, as I did not examine it. It had a black line along the back, and all the rest of the body was variegated with alternate bands of white and tawny. The head was very long, and striped in the same manner with the body. The ears were black, yellow, and white. The legs were striped like the body, not lengthways, but round, in the manner of garters. The whole of these stripes or bands were disposed with such symmetry, that no tiger or leopard's skin could equal the beauty of this animal's skin. Two similar asses, belonging to the same ambassador, died on the road, and he was carrying their skins, together with the animal that survived, as a present to the grand seignior.—*Relat. d'un Voyage*, par Thevenot, tom i. p. 473.

They have, however, made him submit to be mounted; but it requires great precaution. Two men hold the bridle, while a third sits on the animal's back. His mouth is extremely hard: his ears are so sensible, that he flings whenever they are touched, and, like a vicious horse, he is restless, and as stubborn as a mule. But the wild horse and the onager are perhaps equally untractable; and it is extremely probable, that, if the zebra were early accustomed to obedience, and to a domestic state, he would become equally gentle with the ass and horse, and might supply the place of both.

The ass, either in a domestic or wild state, is found in almost every warm and temperate climate of the Old Continent, and existed not in the New when it was first discovered. But the species, after being transported thither from Europe, has now subsisted and multiplied greatly in America, during more than two centuries; so that, at present, it is almost equally diffused over the four quarters of the globe. The zebra, on the contrary, which was brought to us from the Cape of Good Hope, seems to be a species limited to the southern regions of Africa; though Lopez asserts, that the zebras are more frequent in Barbary than in Congo, and though Dapper relates that troops of them are found in the forests of Angola.

This beautiful animal, which, both from the variety of its colours and the elegance of its figure, is so superior to the ass, seems, notwithstanding, to be nearly of the same species; since

most travellers give it the name of the *striped ass*, because, at first sight, they are struck with its superior resemblance, both in size and figure, to the ass than to the horse; for it was not with the small common asses that they compared the zebra, but with the largest and most beautiful of the species. I am still inclined to think, however, that the zebra approaches nearer to the horse than the ass; for his figure is so elegant, that though, in general, he is smaller than the horse, the similarities between them, in other respects, are very apparent. To confirm this opinion, it has been remarked, with some degree of surprise, that, in the neighbourhood of the Cape of Good Hope, which appears to be the native country of the zebra, there are horses spotted on the back and belly with yellow, black, red, and azure*. This particular argument is supported by the general fact, that, in all climates, the colour of the horse varies more than that of the ass. We pretend not to decide this question; but we hope it will soon be determined. As the Dutch have lately transported great numbers of these elegant animals, and have even yoked them in the stadtholder's chariot†, it is probable, that, in a short time, we shall receive information of every thing relating to their nature. That industrious nation cannot fail to make these animals unite among themselves, and perhaps

* Captain Robert's Voyage, tom. i. p. 94.

† The count was misinformed respecting this circumstance, which he elsewhere contradicts.

with horses and asses, in order to produce direct or bastard races. In Holland there are several expert naturalists, who will perhaps succeed better than we did in the multiplication of the zebra, upon which only a single experiment was made at the royal menagery in the year 1761. The male, which was four years of age, disdained the she-asses, though in season, and no more were presented to him. Perhaps he was also too young. Besides, he was not rendered familiar with the females, a necessary preliminary for succeeding in the union of different species, which Nature seems to require even in the intercourse of individuals of the same species.

M. Allamand, whom I have so often had occasion to quote with acknowledgement, informed me of a singular and interesting fact respecting the zebra. When lord Clive, says Allamand, returned from India, he brought with him a female zebra, which had been given him at the Cape of Good Hope. After having kept it for some time in his park in England, he brought to it an ass, to try if it would not couple with that animal; but the female zebra would not suffer it to approach her. His lordship caused the ass to be painted like the zebra; the female was duped; admitted his embraces; and a foal was born exactly like the mother. The circumstance was mentioned to M. Allamand by general Carnat, a particular friend of lord Clive, whose son confirmed it. Lord Pit has also had the goodness to write me in the following terms: .

“ The late lord Clive had a very fine female

zebra, which I saw at Clennom (one of his seats), with a male foal, not a year old, and which had been produced by the following stratagem. When the female zebra was in season, they frequently presented to her an ass, which she constantly refused to admit. Lord Clive thought that if he painted this ass so as to imitate the colours of the male zebra, he might deceive the female: it succeeded so well, that she produced the foal of which we have been speaking.

“ I have been the last, that is to say, this summer of 1778, to Clennom, to know what is become of the female zebra and its foal, and I was told that the mother was dead, and that the foal had been sent to a distance from lord Clive's, where they had often tried to make it couple with asses, but had never succeeded.”

I must, however, make a slight observation on these facts: it is, that I can hardly believe that the female zebra received the ass merely on account of his fine coat, and that to all appearance he was presented to her at a time when she was in a better disposition than usual, besides we must make a great many experiments, as well with the horse as with the ass, to decide if the zebra is nearer to one than the other. Its production with the ass indicates that it is as near to the horse as the ass kind; since the horse generates with asses, and the ass with the mare: but it remains to be proved, by experiment, if the horse does not produce as well as the ass with the female zebra, and if the male zebra will not

couple with the mare and asses. It is at the Cape only that we can try these unions with success*.

* The vicious manners and indocility of the zebra have been noticed by several travellers, and among others by Barrow, who thinks that, notwithstanding its natural disposition, the animal might be tamed to the advantage of the colonists. "At the Landroet's of Zwellendam," says Barrow, "I saw a male and female zebra, that, while young and attended to, were said to have been mild and docile; but by neglect, and probably by teasing, they had become exceedingly vicious. One of the English dragoons persisted in mounting the female. She kicked and plunged, and laid herself down, but to no purpose; the man kept his seat; till, taking a leap from the high bank of the river, she threw both herself and the rider into the water; but, still keeping hold of the bridle, she dragged him to the shore, when, walking up quietly to him, she put her head down to his face, and completely bit off his ear."—*Travels in Southern Africa*,

THE CZIGITHAI.

THE fertile mule of Tartary, called *czigithai*, may perhaps be an animal of the same species with the zebra; for there seems to be no difference between them, but in colour. Now, it is well known that the differences in the colour of the hair or feathers are extremely slight, and depend on the influence of the climate. The *czigithai* is found in the southern parts of Siberia, in Thibet, in Dauria, and in Tartary. Gerbillon remarks, that these animals are common in the country of the Monguls and Kakas; that they differ from domestic mules; and that they cannot be trained to bear burdens †. Mul-

* CHARACTER SPECIFICUS.

EQUUS HEMIONUS. E. unicolor, pedibus solidungulis, cauda calva extremitate pilosa, cruce nulla. — *Linn. Syst. Nat. Gmel.* i. p. 210. — *Pall. Iter.* iii. p. 217. — *Nov. Comp. Petrop.* xix. p. 394, t. 7.

LE CZIGITHAI. — *Buff. Hist. Nat. par Sonn.* xxxix. p. 367.

DSHIKKETAEI. — *Penn. Hist. Quadr.* i. p. 4, pl. 1.

JICKTA. — *Shaw's Gen. Zool.* ii. p. 427.

HABITAT

in desertis Mongolicis.

† *Hist. Gen. des Voyages*, tom. vi. p. 601.

ler and Gmelin assure us, that they are numerous in the country of the Tongusians, where they are hunted like other game; that, in Siberia, toward Borsja, they are very plenty * in dry years; and he adds, that they resemble, in figure, size, and colour, a bright bay horse, except that they have very long ears *, and a tail like that of a cow. If these travellers, who examined the czigithai, had, at the same time, compared it with the zebra, they would perhaps have discovered a greater number of relations than we are apt to imagine. In the Petersburg cabinet there are stuffed skins both of the zebra and czigithai. Though these skins differ in colour, they may belong to the same, or a very neighbouring species. Time alone can remove or confirm these conjectures. But, as all the other animals of Africa are likewise found in Asia, if the zebra and czigithai are not of the same species, the zebra alone would be an exception to this general rule.

Besides, if the czigithai is not the same with the zebra, it may be the Asiatic animal called *onager* or *wild ass*. The *onager* should not be confounded with the zebra; but I am uncertain whether the same remark is applicable to the *onager* and czigithai; for, from comparing the relations of travellers, it appears, that there are different kinds of wild asses, of which the *onager* is the most remarkable. Perhaps the horse, the ass, the *onager*, and the czigithai,

* Voyage de M. Muller et Gmelin, tom. ii. p. 105, 107.

constitute four distinct species: and, on the supposition that they are only three, it is still uncertain whether the czigithai be an onager or a zebra. The swiftness of the onager is mentioned by travellers, who remark, that he runs with such rapidity as to escape the hunters, though mounted on horses; and they say the same thing of the czigithai. However this matter stands, the horse, the ass, the zebra, and the czigithai, belong to the same genus, and constitute three or four branches of the same family; the two first of which have long been reduced to a domestic state. We may therefore hope, that the two last may likewise be tamed, and prove a useful acquisition to mankind.

The doubts which I still entertained on the difference, or on the identity of the species of czigithai, of onager, and of zebra, have been removed by the communications of M. Forster, who seems to prove that they are really three different animals. The following is what he has written me on the subject.

“ In the country of the Mongul Tartars, we find a great number of wild horses, or *tarpan*s, and another animal called *czigithai*, which, in the Mongul tongue, signifies *long-ear*: these animals are gregarious; we meet with them in the deserts bordering on the Russian empire, and in the great desert *Gobee* (or *Cobi*): they go in troops of twenty, thirty, or even a hundred. All the Tartar nations agree, that the swiftness of this animal greatly exceeds that of the best hunter; one bad quality is, that it can never be

tamed. A Cossac, after having caught a young czigithai, and fed it for several months, was not able to preserve the animal; for it killed itself by the efforts which it made to escape.

Every troop of czigithais has its chief, like the tarpans, or wild horses. If the czigithai chief discovers the hunters at a distance, he quits the troop, and alone reconnoitres the danger: when he is satisfied, he gives the signal for flight, and is followed by his troop; but if unfortunately the chief should be killed, the troop (without a leader) disperse, and the hunters are sure to kill several others.

The czigithais are principally found in the deserts of the Monguls, and in that called *Gobee*; it is a species between the ass and the horse, which has occasioned Dr. Messchermidt, to call this animal *the fruitful mule of Daoury**, because it resembles the mule, although in reality it is infinitely more beautiful.

It is as large as a moderate sized mule; the head is rather heavy; the ears are straight; longer than those of a horse, but shorter than a mule's; the breast is large, square below, and rather compressed; the mane is short and bristled, and the tail is exactly like that of the ass; the hoofs are small. Thus the czigithai resembles the ass in the mane, the tail, and the hoofs. It has also less flesh on its legs than the horse, and a lighter and more active shoulder. The feet and lower part of the legs, are thin

* A Russian province in Siberia.

and well made. The spine of the back is straight, and formed like that of the ass, but rather flat. The prevailing colour of these animals is yellowish brown: the head, from the eyes to the muzzle, and the inside of the legs, is of a buff colour: the mane, and the tail are almost black, and along the back, there is a band of blackish brown, which spreads on the rump, and contracts towards the tail. In winter their hair is long and waved, but in summer it is short and shining. These animals carry their heads high, and, in running, keep their nose to windward. The Tongous, and other nations bordering on the great deserts, esteem their flesh as delicious."

THE KOULAN*.

"I AM" again indebted to Mr. Forster for what I have to say on this species. " Besides the tarpans, or wild horses, and the czigithais, or fertile mules of Daoury, we find, in the great deserts beyond the Yaik, the Yemba, the Sarason, and in the neighbourhood of Lake Aral, a third kind of animal, which the Kirgusians and the Kalmucs call *Koulán*, or *Khoulán*; this appears to be the *onager* or *onagre* of authors, and seems to make a connecting shade between the czigithai and the ass. In summer, the koulans live in the great deserts which we have mentioned under the article czigithai, and towards the mountains of Tamanda: but on the approach of winter they retire toward the confines of Persia, and the Indies. They run with incredible velocity; and there are troops of them of several thousands together; not one has ever been tamed.

They are larger than the tarpans, but less than the czigithais. Their hair is of a fine gray, sometimes with a light shade of bluish, and at other times with a mixture of yellow:

* The koulán is the ass in its wild state.

a black band runs along the back, and another band, of the same colour, crosses the withers, and descends on the shoulders. Their tail is exactly like that of the ass, but the ears are not so large and spacious.

THE QWAGGA*.

THIS animal, of which I was ignorant till after the printing of the two preceding articles, appears to me to be a bastard, or intermediate species, between the horse and the zebra, or rather between the zebra and the onager. The following is what M. Allamand has lately published in a supplement to the edition of my work printed in Holland.

“Till now,” says this learned naturalist, “we have been acquainted only with the name of this animal, and even that very imperfectly, without knowing to what quadruped the name referred.

* CHARACTER SPECIFICUS.

EQUUS QUAGGA. — E. pedibus solidungulis, supra castaneus, fasciis fuscis, ad latera maculatus, subtus, pedibus cruribusque albus. — *Linn. Syst. Nat. Gmel. i. p. 213.*

Opengha, or Quagga of the Hottentots. — *Masson's Travels, Phil. Trans. vol. lxvi. p. 297.*

LE KWAGGA OR COUAGGA. — *Buff. Hist. Nat. par Sonn. xxix. p. 380, pl. 19.*

QUAGGA. — *Penn. Hist. Quadr. i. p. 14. — Shaw's Gen. Zool. ii. p. 440, pl. 218.*

HABITAT

in Africa meridionali

W.



QUAGGA.

In the journal of a journey into the interior of Africa, undertaken by order of the governor of the Cape of Good Hope, it is said that, among other animals, the travellers saw wild horses, asses, and *quachas*. The signification of this last word was absolutely unknown, when Mr. Gordon informed me that the name of quacha was the same as that of kwagga, which the Hottentots give to the animal in question, and which I have retained, because, having never been described, nor even known in Europe, it can only be expressed by the name which it bears in its native country. The ornamental stripes on the skin, caused it at first to be considered as a variety of the zebra, from which, however, it differs in several respects. Its colour is a deep brown, and, like the zebra, it is very regularly striped with black, from the end of the muzzle to the top of the shoulders; and the same stripes are continued over its pretty mane. The stripes begin to shorten from the shoulders, and, continually diminishing, disappear in the abdominal region, before they reach the thighs. Between the stripes there is one of a clearer brown, and it is almost white at the ears. The under part of the body, the thighs, and the legs, are white; the tail, which is rather flat, is also furnished with hairs of the same colour. The hoof is black, and, in its shape, bears a much stronger resemblance to that of the horse, than the zebra; this may be proved by comparing the figure which I have given with that of the last mentioned animal. Besides, the character of these

animals is also very different; the couaggas are more docile, for it has been found impossible hitherto to tame zebras, so as to make them fit for domestic purposes; whereas the colonists of the Cape yoke the couaggas to their carts, which they draw very well. They are hardy and strong. It is true they are mischievous; they bite and kick; when a dog goes too near, they strike at him with their feet, and sometimes seize him with their teeth: even the hyænas, which are called Cape wolves, dare not attack them; they go in troops, often of more than a hundred in number, but a zebra is never seen amongst them, although they inhabit the same places.

We are much obliged to Mr. Gordon, for our knowledge of this animal, since it is he who sent me the drawing and description. One day, he saw two troops, one composed of ten full grown couaggas, and the other consisting entirely of foals, which were running after their mothers. He pushed his horse between the two troops, and one of the foals, having lost sight of its conductor, immediately followed his animal, as if it had been its mother. Young zebras will do the same, on a similar occasion. Mr. Gordon

then in the Bosjesman's country, at a great distance from any habitation, so that he was obliged to leave the foal on the next day, for want of milk to support it. At that time he had another, which he reserved for the menagerie of the prince of Orange. Not being able to procure an adult couagga, he sent me only the drawing

of a foal; but he writes me, that there is no difference between a foal and a full grown couagga, except in the size, which equals that of a zebra, and in the head, which in the adult couagga is rather longer in proportion. The difference between the males and females is also very trifling.

“ Since the Cape has been inhabited, these animals have quitted the neighbourhood, and are no longer to be found, except in the interior of the country. They make a very quick kind of barking noise, in which is often distinguished the repetition of the syllable *kwah, kwah*. The Hottentots find the flesh very good; but the Dutch boors dislike it on account of its unsavoury flavour.

“ The foal represented in the plate, was three feet seven inches and three lines from the end of the muzzle to the tail: the height, from the shoulder, was two feet six inches; the hind quarter was an inch lower; its tail was fourteen inches long.”

This is all that M. Allamand has collected respecting this animal; but it must not prevent me from observing that there appears to be two contrary observations in the account by Mr. Gordon. He says, in the first place, *that the country people of the Cape yoke couaggas to their carts, which they draw very well*, and afterwards he affirms that he could not procure a drawing of an adult couagga. It appears, then, that these animals are rare at the Cape, since he could only make his drawing from a foal: if the species were domesticated, it would have been easy for him to have procured one of the

full grown animals. We hope that this travelling naturalist will give us more ample information about this animal, which appears to me to approach the zebra nearer than any other.



HIPPOPOTAMUS.

THE HIPPOPOTAMUS.

THOUGH the hippopotamus has been celebrated from the remotest antiquity; though the sacred writings mention him under th

CHARACTER GENERICUS.

Dentes primores in utraque maxilla quatuor; superiores per paria, remoti; inferiores prominentes, intermedius longioribus

Laniarii solitarii, inferiores longissimi, oblique truncati, recurvati.

Pedes margine unguiculati.

CHARACTER SPECIFICUS.

HIPPOPOTAMUS AMPHIBIUS. II. pedibus quadrilobis. — *Linn. Syst. Nat. Gmel.* i. p. 214.

HIPPOPOTAMUS. — *Plin. Gesn. — Aldrov. Jonst. — Ray, &c., &c.*

HIPPOPOTAMO. — *Serenghi. Monogr.*

HIPPOPOTAME. — *Jussieu, Mem. de l'Acad.* 1724, p. 209, descriptio et figura cranii. — *Briss. Regn. Anim.* p. 122. — *Adanson. Voyag.* p. 73.

L'HIPPOTAME. — *Buff. Hist. Nat. por Sonn.* xxx. p. 1, pl. 2, 3.

HIPPOPOTAME. — *Penn. Hist. Quadr.* i. p. 167, pl. 31, 32.

HIPPOPOTAMUS. — *Shaw's Travels*, p. 427. — *Shaw's Gen. Zool.* ii. p. 442, pl. 219. — *Wood's Zoography*, i. p. 96 pl. 5.

name of *behemoth*; and though his figure is engraved on the Egyptian obelisks, and on the Roman medals; yet he was very imperfectly known

HABITAT

in fluviis Africæ a Nigro usque ad caput bonæ spei, nec non in Nilo superiore inque lacubus Æthiopiæ, quos transfluit Nilus; rarior in ostiis fluviorum. In Asia reperi dūbium.

W.

The hippopotame has four cutting teeth in each jaw. Those in the middle are straight and pointed forward, the two middlemost the largest. It has four tusks, those in the upper jaw are short, and the lower very long, and truncated obliquely. The head is of an enormous size, and the mouth is vastly wide. The ears are small and pointed, and lined within very thickly with short fine hairs. The eyes and nostrils are small in proportion to the bulk of the animal. On the lips are some strong hairs scattered in patches here and there. The hair on the body is very thin, of a whitish colour, and scarce discernable at first sight. There is no mane on the neck, as some writers feign, only the hairs on that part are rather thicker. The skin is very thick and strong, and of a dusky colour. The tail is about a foot long, taper, compressed, and naked. The hoofs are divided into four parts; but, notwithstanding it is an amphibious animal, they are not connected by membranes. The legs are short and thick. In bulk, it is second only to the elephant. The length of a male has been found to be seventeen feet, the circumference of the body fifteen, the height near seven, the legs near three, the head above three and a half, and the girth near nine. — *Penn. Synops. Quadr.* p. 78.

In Hebrew, *Behemoth* — *Shaw's Travels, Suppl.* p. 87. *Bochart*; in Greek, ἵπποπόταμος — *Arist. Hist. Anim.* lib. ii. c. 7; in Latin, *Hippopotamus*; in Italian, *Hippopotamo*; in the Egyptian language, according to *Zerenghi, Forast'bar*, which signifies *sea-horse*.

Hippopotamo. — *La vera descriptione dell hippopotamo, autore Federico Zerenghi da Narni, medico Chirurgico in Napoli,*

to the ancients. Aristotle * speaks of this animal in the most superficial manner; and in the little he says, there are more errors than truth. Pliny † copies Aristotle, and, instead of correcting, adds to the number of his blunders. It was not till about the middle of the sixteenth century that any precise information was obtained concerning this animal. Belon, being then at Constantinople, saw a living hippopotamus, of which, however, he gives but an im-

1603, p. 67. *Note*, This description of the hippopotamus makes a part of an abridgement of surgery, composed by the same author, on the 65th page of which is the particular title above quoted. This small work, which is both original and excellent, is at the same time so rare, as not to be mentioned by any naturalists. The figure was drawn from a female hippopotamus.

* *Equo fluviatili, quem gignit Egyptus, juba equi, ungula qualis bubus, rostrum resimum. Talus etiam inest bisulcorum modo; dentes exerti sed leviter; cauda apri, vox equi, magnitudo asini, tergoris crassitudo tanta ut ex eo venabula faciant, interiora omnia equi et asini similia. — Arist. Hist. Anim., lib. ii. cap. 7. . . . Natura etiam equi fluviatilis ita constat, ut vivere nisi in humore non possit. — Idem. lib. viii. cap. 24.* *Note*, The hippopotamus has no mane like the horse; and his hoofs are not divided into two, but into four. His tusks appear not on the outside of the mouth. His tail is very different from that of the wild boar; and he is at least six times larger than the ass. Like other quadrupeds, he can live on land; for the one described by Belon had lived two or three days without entering the water. Hence Aristotle must have had very bad information concerning this animal.

† Pliny says that the hippopotamus inhabits the sea as well as the rivers, and that he is covered with hair like the sea-calf. *Note*, This last fact is advanced without any foundation; for it is certain that he has no hair on his skin, and that he was never seen nearer the sea than the mouths of rivers.

perfect representation; for the two figures which he has added to his description were not drawn from the animal he saw, but were copied from the reverse of Adrian's medal, and from the Egyptian Colossus at Rome. Hence the æra of any exact knowledge concerning this animal must be brought forward to the year 1603, when Federico Zerenghi, a surgeon of Narni in Italy, printed at Naples the history of two hippopotami which he had taken alive in a great ditch dug on purpose in the neighbourhood of the Nile, near Damietta. This little book was written in Italian; and, though it be the only thing original we have upon this subject, it seems to have been totally neglected both by contemporary and succeeding naturalists. The description it contains of the hippopotamus is, at the same time, so good, and appears so worthy of credit, that I shall here give an extract and translation of it.

“ With a view,” says Zerenghi, “ of obtaining an hippopotamus, I stationed men upon the Nile, who, having seen two of these animals go out of the river, made a large ditch in the way through which they passed, and covered it with thin planks, earth, and herbage. In the evening, when returning to the river, they both fell into the ditch. I was immediately informed of the event, and hastened to the place along with my Janissary. We killed both the animals by pouring three shot into each of their heads from a large arquebuse. They almost instantly expired, after uttering a cry which

had more resemblance to the bellowing of a buffalo, than to the neighing of a horse. This exploit was performed on the 20th day of July, 1600. The following day, they were drawn out of the ditch, and carefully skinned. The one was a male and the other a female. I caused their skins to be salted, and stuffed with the leaves of the sugar cane, in order to transport them to Cairo, where they were salted a second time with more attention and convenience. Each skin required four hundred pounds of salt. On my return from Egypt, in 1601, I brought these skins to Venice, and from thence to Rome. I showed them to several intelligent physicians. Doctor Jerome Aquapendente and the celebrated Aldrovandus were the only persons who recognised them to be the spoils of the hippopotamus; and, as Aldrovandus's work was then printing, I allowed him to draw a figure from the skin of the female, which he inserted in his book.

"The skin of the hippopotamus is very thick, and very hard; it is even impenetrable, unless after being long steeped in water. The mouth is not, as the ancients allege, of a middle size, but enormously large. Neither are his feet divided into two toes, but into four. His size is not that of an ass; for he is much larger than the largest horse or buffalo. His tail resembles not that of a hog, but rather that of the tortoise, only it is incomparably larger. The muzzle is not turned up, but resembles that of the buffalo, and is much

larger. He has no mane, but only a few short, scattered hairs. He neither bays like a horse, nor bellow like a buffalo, but his voice is a medium between the bellowing of a buffalo and the neighing of a horse. He has no teeth visible but a row of the mouth; but, when the mouth is shut, the teeth, though extremely large, are all concealed within the jaw. The inhabitants of this part of Egypt call him *foras' bay*, which signifies the sea-horse. . . . Belon's description is very erroneous.

Belon's description of the teeth of the horse, which would lead us to think, contrary to his own assertion, that he had never seen it; for the teeth of the hippopotamus are very large and very singular. . . . To remove every uncertainty," continues Zérenghi, "I here give the figure of the female hippopotamus, with all the dimensions and proportions of the body and members, drawn exactly according to nature.

"The length of this hippopotamus, from the extremity of the upper lip to the origin of the tail, is nearly eleven feet two inches *.

"The circumference of the body is about ten feet.

"The height, from the sole of the foot to the top of the back, is four feet five inches.

"The circumference of the legs, near the shoulders, is two feet nine inches, and, when taken lower, one foot nine inches and a half.

"The length of the legs, from the sole of the

* The following measurements are all Paris feet and

foot to the breast, is one foot ten inches and a half.

“ The length of the feet from the extremity of the nails, is about four inches and a half.”
Nota, I have here taken a mean between Zerenghi’s two measures for the length of the feet.

“ The nails, or divisions of the hoof, are as long as they are broad, being two inches and two lines.

“ Each toe has a nail, and each foot four toes. The skin, on the back, is near an inch, and that on the belly about seven lines thick.

“ The skin, when dried, is so hard that a musket ball cannot pierce it. The country people make large shields of it, and likewise use it for thongs or whips. On the surface of the skin there are a few scattered whitish hairs, which are not perceptible at first sight. On the neck the hairs are longer, and all of them placed one by one, at greater or smaller distances from each other. But, on the lips, they form a kind of whiskers ; for, in several places, ten or twelve of them issue from the same point. These hairs are of the same colour as the others, only they are harder, thicker, and somewhat longer, though none of them exceeds half an inch in length.

“ The length of the tail is eleven inches four lines: its circumference, at the origin, is a little more than a foot, and, at the extremity, two inches ten lines.

“ The tail is not round ; but, from the middle

to the point, it is flattened, like that of an eel. Upon the tail and the thighs there are some round scales, of a whitish colour, and as large as lentiles. These small scales likewise appear on the breast, the neck, and some parts of the head.

“ From the extremity of the lips to the beginning of the neck, the head is four feet four inches.

“ The circumference of the head is about five feet eight inches.

“ The ears are two inches nine lines long, two inches three lines broad, a little pointed, and garnished in the inside with fine, short, thick hairs, of the same colour as the others.

“ The eyes, from one corner to the other, are two inches three lines; and the eyelids are distant from each other one inch one line.

“ The nostrils are two inches four lines long, and one inch three lines broad.

“ The mouth opens to the width of one foot five inches four lines. It is of a square form, and furnished with forty-four teeth of different figures * All these teeth are so hard, that they strike fire with steel. It is chiefly the enamel of the canine teeth which possesses this degree of hardness, the internal substance of the whole being softer When the hippo-

* In three heads of the hippopotamus, preserved in the royal cabinet, there are only thirty-six teeth. As these heads are smaller than that described by Zerenghi, it may be presumed that, in young hippopotami, all the grinders are not developed, and that adults have eight more.

tamus keeps his mouth shut, no teeth appear without, but are all covered with the lips, which are extremely large.

“ With regard to the figure of the hippopotamus, it appears to be a medium between that of the buffalo and hog, because it participates of both, except the cutting teeth, which have no resemblance to those of either of these animals. The grinding teeth have some similarity to those of the buffalo or horse, though they are much longer. The colour of the body is dusky and blackish. . . . We are assured that the hippopotamus produces but one at a time; that he lives upon fishes, crocodiles, and even cadaverous flesh. He eats, however, rice, grain, &c., though, if we consider the structure of his teeth, it would appear that Nature had not destined him for pasture, but for devouring other animals.”

Zerenghi finishes his description by informing us, that all these measures had been taken from the female subject, and that the male perfectly resembled her, except that, in all his dimensions, he was one third larger. It were to be wished that the figure given by Zerenghi had been equally good as his description: this animal, however, was not drawn from the life, but from the skin of the female. It likewise appears, that Fabius Columna took his figure from the same skin, which was preserved in salt. But Columna's description is not equal to that of Zerenghi; and he even merits reproach for mentioning only the name, and not the work, of this author,

though it was published three years before his own. For example, Columna remarks, that, in his time (1603), Federicq Zerenghi brought from Egypt to Italy an entire hippopotamus, preserved in salt, though Zerenghi himself tells us, that he brought only the skin. Columna makes the body of his hippopotamus thirteen feet long*, and fourteen feet in circumference, and the legs three feet and a half in length; while, by the measures of Zerenghi, the body was only eleven feet two inches long, its circumference ten feet, the legs one foot ten inches and a half, &c. We can have no dependence, therefore, on Columna's description: neither can he be excused by supposing that his description was taken from another subject; for it is evident, from his own words, that he described the smallest of Zerenghi's two hippopotami, since he acknowledges, that, some months afterwards, Zerenghi exhi-

* Hippopotami a nobis conspecti ac dimensi corpus a capite ad caudam pedes erat tredecim, corporis latitudo sive diameter pedes quatuor cum dimidio, ejusdem altitudo pedes tres cum dimidio, ut planum potius quam carinosum ventrem habeat: orbis corporis quantum longitudo erat: crura e terra ad ventrem pedes tres cum dimidio: ambitus crurum pedes tres; pes latus pedem; ungulæ singulæ uncias tres: caput vero latum pedes duo cum dimidio, longum pedes tres; crassum ambitu pedes septem cum dimidio: oris rictus pedem unum, &c. Perhaps the foot used by Columna was shorter than the Paris foot. But this circumstance will not justify him; for the body of his hippopotamus being thirteen feet long, its circumference ought to have been only eleven feet seven or eight inches, and not fourteen feet. The other proportions are equally erroneous; for they correspond not with those given by Zerenghi.

bited a second hippopotamus, which was much larger than the first. I have insisted upon this point, because nobody has done justice to Zerenghi, though he merits the highest eulogiums. On the contrary, all naturalists, for these hundred and sixty years, have ascribed to Fabius Columna what was due to Zerenghi alone; and, instead of inquiring after the work of the latter, they have contented themselves with copying and praising that of Columna, though, with regard to this article, he is neither original, exact, nor even honest.

The description and figures of the hippopotamus, which Prosper Alpinus published more than a hundred years after, are still worse than those of Columna, having been drawn from ill preserved skins; and M. Jussieu*, who wrote upon the hippopotamus in the year 1724, has only described the bones of the head and feet.

By comparing these descriptions, and especially that of Zerenghi, with the information derived from travellers†, it appears that the hippo-

* Mem. de l'Acad. de Sciences, ann. 1724, p. 209.

† In the river Nile there are *hippopotami* or *sea-horses*. In the year 1658, one of them was taken at Girge. It was soon brought to Cairo, where I saw it in the month of February of the same year; but it was dead. This animal was of a kind of tawny colour. Behind he resembled the buffalo; but his legs were shorter and thicker. He was as tall as a camel. His muzzle resembled that of an ox; but his body was twice as large. His head was similar to that of a horse, but larger. His eyes were small, his neck very thick, his ears small, his nostrils very large and open, his feet very large, almost round, with four toes on each, like those of the crocodile, and his

potamus is an animal whose body is longer, and as thick as that of the rhinoceros; that his legs are much shorter*; that his head is not so long, but larger in proportion to his body; that he has no horns, either on the nose, like the rhinoceros, or on the head, like the ruminating ani-

tail, small. Like the elephant, he had little or no hair on the skin. In the under jaw, he had four large teeth, about half a foot in length. Two of them were crooked, and as thick as the horns of an ox. At first, he was mistaken for a sea buffalo. But I, and some others, who had read descriptions of this animal, knew it to be a sea-horse. It was brought dead to Cairo by the Janissaries, who shot it on land, where it had come to feed. They poured several shots into it before it fell; for, as I formerly remarked, a musket ball hardly pierces its skin. But one ball entered its jaw, and brought it to the ground. None of these animals had been seen at Cairo for a long time. — *Relation d'un Voyage du Levant, par Thénot*, tom. i. p. 491.

* The legs of the hippopotamus are so short, that the belly of the animal, when he walks, is not more than four inches above the ground.—*Belon des Poissons*, p. 17. *Crura e terra ad ventrem pedes tres cum dimidio*. — *Fabius Columna*, p. 31. The testimonies of Belon and Columna, with regard to the length of the legs, differ so widely, that none of their dimensions can be adopted. It must be remarked, that the hippopotamus which Belon saw alive, was very young and very fat; that, of course, his belly must have been large and pendulous; that, on the contrary, the skin described by Columna, which was the same with that of Zerenghi, had been dried with salt, and, consequently, Columna could not be certain that the belly of the animal was not round but flat. Thus the measures of Belon are too short for an adult hippopotamus, and those of Columna too long for a living one. Hence we may infer from both, that, in general, the belly of this animal is not above a foot and a half from the ground; and that, as Zerenghi remarks, its legs exceed not two feet in length.

mals. As the 'cry he utters when pained is composed, according to ancient authors and modern travellers *, of the neighing of a horse and the bellowing of a buffalo, his ordinary voice may perhaps resemble the neighing of a horse, from which, however, he differs in every other respect. If this be the case, we may presume that the animal has obtained the name *hippopotamus*, which signifies the *river-horse*, solely from the similarity of his voice to that of a horse; in the same manner as the lynx, from his howling like a wolf, obtained the appellation of *lupus cervarius* †. The cutting, and particularly the canine teeth of the lower jaw, are very long, and so hard and strong, that they strike fire with steel ‡. This circumstance, it is

* Vocem equinam edit, illius gentis relatione. — *Prosp. Alp. Egypt. Hist. Nat.* lib. iv. p. 248. Merolla says, that, in the river Zaira, there are river-horses, which neigh like the common horse. — *Hist. Gen. des Voyages, par M. l'Abbé Prevost*, tom. v. p. 95. This animal has derived his name from his neighing like a horse. — *Recueil de Voyages de la Compagnie des Indes de Hollande*, tom. iv. p. 440. The neigh of the hippopotamus differs little from that of a horse; but it is so loud as to be heard distinctly at the distance of more than a quarter of a league. — *Voyage au Senegal, par M. Adanson*, p. 73.

† See the article *Lynx*.

‡ Tutti i denti sono di sostanza così dura, che percossovi sopra con un cortello, o accialino, buttano faville di foco in gran quantita, ma piu le zanne che gli altri; ma dentro non sono di tanto dura materia. — *Zerenghi*, p. 72. . . . Dentes habebat in inferiore maxilla sex, quorum bini exteriores e regione longi semipedem, lati et trigoni uncias duas cum dimidio per ambitum semipedem, aprorum modo parum re-

probable, gave rise to the fable of the ancients, that the hippopotamus vomited fire from his mouth. The substance of the canine teeth is so white, so fine, and so hard, that it is preferable to ivory for making artificial teeth*. The cutting-teeth, especially those of the under jaw, are

trorsum decliſes, non adunci, non exerti, sed admodum conspicui aperto ore. Intermedii vero parum a gingiva exerti trigona acie digitali longitudine, medium locum occupantes, veluti jacentes crassi, orbiculati, elephantini senipedem superant, longitudine, atque aciem in extremis partibus planam parum detractam. Maxillares vero utrinque septem crassos latos breves admodum. In superna vero mandibula, *quam crocodili more mobilem habet*, qua mandit et terit, anteriores sex insunt dentes, sex imis respondentes acie contrario modo adaptata, levissima ac splendida, eboris politi modo, clausoque ore conjunguntur, aptanturque imis, veluti ex illis recisi, ut planum plano insideat; verum omnium acies pyramidalis veluti oblique recisi calami modo, sed medii superiores non aciem inferiorum, at medium illorum in quo detractio conspicitur rotunditatis, petunt; ac non incidere, sed potius illis terere posse videtur. Molares totidem quot inferni, sed binii priores parvi exigui, atque rotundo ambitu, et ab aliis distant, ut medium palatum inter dentes anteriores occupare videantur; inter maxillares dentes linguæ locus semipedalis remanebat. Dentium vero color eburneus parum pallens, splendidus, diaphanus fere in acie videbatur; durities illorum silicea, vel magis cutelli quidem costa non parva conspicientium admiratione ignis excitabantur favillæ, parum vel nihil tot percussionibus signi remanente: quapropter verisimile foret noctis tempore dentes torendo ignem ex ore evomisse.—*Fab. Columna*, p. 32.

* The finest and whitest teeth of the hippopotamus are found at Cape Mesurada in Africa. The dentists prefer them to ivory for making artificial teeth; because they are harder, whiter, and do not turn yellow so soon.—*Voyage de Desmari-ſais*, tom. ii. p. 148.

very long, cylindrical, and chamfered. The canine teeth are also long, crooked, prismatic, and sharp, like the tusks of the wild boar. The grinders are square or oblong, like those of man, and so large that a single tooth weighs more than three pounds. The largest cutting and canine teeth are twelve *, and sometimes sixteen inches long †, and each of them weighs from twelve to thirteen pounds ‡.

In fine, to give a just idea of the magnitude of the hippopotamus, we shall employ the measures of Zerenghi, and augment them one third; because these measures were taken from the female, which was one third less than the male in all its dimensions. This male hippopotamus was, of course, sixteen feet nine inches long, from the extremity of the muzzle to the origin

* Post menses aliquot alium (hippopotamum) longe majorem, *idem*, Federicus Zerenghi, Romæ nobis ostendit, cujus dentes aprini pedali longitudine fuerunt, proportione crassiores, sic et reliqua omnia majora.—This passage, which finishes Fabius Columna's description, proves that it was taken from the female or smaller hippopotamus of Zerenghi, and that the largest, of which he gives no description, was a male. It likewise proves that no dependence can be had on Columna's measures; for he is no where exact but in the dimensions of the teeth, because they can neither contract nor lengthen; but a skin dried in salt varies in all its dimensions.

† I remarked, that these teeth, which were crooked in the form of an arch, were about sixteen inches long, and that, where thickest, they were more than six inches in circumference.—*Dampier's Voyages*, tom. iii. p. 360.

‡ As to the river-horses, I never saw any of them; but I purchased some of their teeth, which weighed thirteen pounds.—*Relation de Therenot*, p. 19.

of the tail, fifteen feet in circumference, and six feet and a half high; and the legs were about two feet ten inches long. The head was three feet and a half in length, and eight feet and a half in circumference. The opening of the mouth was two feet four inches; and the largest teeth were more than a foot long.

With such powerful arms, and such prodigious strength of body, the hippopotamus might render himself formidable to all other animals. But he is naturally mild*; besides, he is so heavy and slow in his movements, that he could not overtake any quadruped. He swims faster than he runs; and he pursues fishes, and preys upon them†. Though he delights in the water, and lives in it as freely as upon land; yet he has not, like the beaver or otter, membranes between his

* Qui hippopotamum animal terribile et crudele esse putarunt, falsi mihi videntur. Vidimus enim nos adeo mansuetum hoc animal, ut homines minime reformidaret, sed benigne sequeretur. Ingenio tam miti est, ut nullo negotio cicuretur, nec unquam morsu lædere conatur. . . . Hippopotamum e stabulo solutum exire permittunt, nec metuunt ne mordeat. Rector ejus, cum spectatores oblectare libet, caput aliquot brassicæ capitatae, aut melopeponis partem, aut fascem herbarum aut panem e manu sublimi protendit feræ: quod ea conspicata tanto rictum hiatu diducit, ut leonis etiam hiantis caput facile suis faucibus caperet. Tum rector quod manu tenebat in voraginem illam seu saccum quempiam immittit. Manducat illa et devorat. — *Bellonius de Aquatilibus*.

† The hippopotamus walks slowly on the banks of the rivers; but swims very quickly in the water. He lives upon fishes, and every thing he can seize. — *Dampier*, vol. iii. p. 360.

toes. * The great size of his belly renders his specific gravity nearly equal to that of water, and makes him swim with ease. Besides, he continues long at the bottom of the water *, where he walks as in the open air: and, when he comes out of it to pasture, he eats sugar canes, rushes, millet, rice, roots, &c., of which he consumes great quantities, and does much damage in the cultivated fields. But, as he is more timid on land than in the water, it is not difficult to drive him off. His legs are so short, that, when at a distance from water, he cannot escape by flight. When in danger, his only resource is to plunge into the water, and travel under it a great way before he again appears. When hunted, he generally flies; but, when wounded, he returns with fury, darts boldly against the boats, seizes them with his teeth, tears pieces off them, and sometimes sinks them †. “I have known,” says a traveller ‡, “the hippopotamus open his mouth, and set one tooth on the gunnel of a boat, and another on the second strake from the keel (which was more than four feet distant), and there bit a hole through the plank, and sunk the boat; and, after he had done, he went away shaking his ears. His strength is incredibly

* I have seen the hippopotamus descend to the bottom of three fathoms water, and remain there more than half an hour before he returned to the surface. — *Id. ibid.*

† Hippopotamus cymbis insidiatur quæ mercibus onustæ secundo Nigro feruntur, quas dorsi frequentibus gyris agitata demergit — *Leon. Afric. Descript.* tom. ii. p. 758.

‡ Dampier, vol. ii. part ii. p. 105.

great ; for I have seen him, in the wash of the shore, when the sea has tossed in a Dutchman's boat with fourteen hogsheads of water in her, upon the said beast, and left it dry on its back ; and another sea came and fetched the boat off, and the beast was not hurt, as far as I could perceive. How his teeth grow in his mouth I could not see ; only that they were round like a bow, and about sixteen inches long ; and in the biggest part more than six inches about. We made several shot at him ; but to no purpose, for they would glance from him as from a wall. The natives call him *kittimpungo*, and say he is *Tetisso*, which is a kind of god ; for nothing, they say, can kill him : and, if they should do to him as the white men do, he would soon destroy their canoes and fishing nets. Their custom is, when he comes near their canoes, to throw him fish ; and then he passeth away, and will not meddle with their fishing craft. He doth most mischief when he can stand on the ground ; but, when afloat, hath only power to bite. As our boat once lay near the shore, I saw him go under her, and with his back lift her out of the water, and overset her with six men aboard ; but, as it happened, did them no harm. Whilst we lay in the road, we had three of them, which did trouble this bay every full and change, and two or three days after. The natives say, they go together, two males and one female. Their noise is much like the bellowing of a large calf." These facts are sufficient to give an idea of the strength of this animal. Many similar facts are to be found

in the General History of Voyages, by the Abbé Prevost, where we have a complete and judicious collection* of all that has been delivered by travellers concerning the hippopotamus.

The individuals of this species are not numerous, and seem to be confined to the rivers of Africa. Most naturalists tell us that the hippopotamus is also found in India. But the evidence they have of this fact appears to be equivocal. Alexander's† letter to Aristotle would be the most positive, if we could be certain that the animals mentioned in it were really hippopotami; which to me seems very problematical; for, if they were, Aristotle must have told us, in his History of Animals, that the hippopotamus was a native of India as well as of Egypt. Onesicritus‡ and some old authors say, that the hippopotamus was found in the river Indus. But this

* Hist. Gen. des Voyages, tom. v. p. 95, 330.

† Humanas carnes hippopotamis pergratas esse, ex eis collegimus, quæ in libro Aristotelis de mirabilibus Indiæ habentur, ubi Alexander Macedo scribens, ad Aristotelem inquit: "Ducentos milites de Macedonibus, levibus armis, nisi per anum nataturos; itaque quartam fluminis partem nataverunt, cum horrenda res visu nobis conspecta est, hippopotami inter profundos aquarum ruerunt gurgites, aptosque milites nobis flentibus absumpserunt. Iratus ego tunc ex eis, qui nos in insidias deducebant, centum et quinquaginta mitti in flumen jussi, quos rursus hippopotami justa dignos poena confecerunt."—*Aldrov. de Quad.* p. 188 et 189.

‡ In India quoque reperitur hippopotamus, ut *Onesicritus* est autor, in anine Indo. — *Hermolans apud Gesner de Piscibus*, p. 417.

fact has received no confirmation from modern travellers, at least from such of them as merit the greatest degree of credit: they all agree*, that the hippopotamus is found in the Nile, and Senegal or Niger, the Gambia, the Zaira, the other great rivers and lakes of Africa †, especially in the southern and eastern regions of that country. None of them say positively that this animal exists in Asia. Father Boym ‡ is the only one who seems to insinuate that the hippopotamus is found in Asia. But his relation appears to be suspicious, and, in my opinion, only proves that this animal is common in Mosambique, and all the eastern parts of Africa. At present, the hippopotamus, which the ancients call the *horse of the Nile*, is so rare in the lower Nile, that the inhabitants of Egypt are totally ignorant of the name §. He is equally unknown in all the north-

* Cosmographie du Levant, par Andrie Thevet, p. 139; Leonis Africæ, Africae Descript. tom. ii. p. 758; L'Afrique de Marmol, tom. i. p. 51, et tom. ii. p. 144; Relation de Thevenot, tom. i. p. 401; Relation de l'Ethiopie, par Poncel. Lettres Edif. 4 Recueil, p. 363; Description de l'Egypte, par Maillet, tom. ii. p. 126; Description du Cap de Bonne Esperance, par Kolbe, tom. iii. p. 30; Voyage de Flacourt, p. 394; Histoire de l'Abyssinie, par Ludoff. p. 43 et 44; Voyage au Senegal, par M. Adanson, p. 73. &c.

† Relation de l'Ethiopie, par Ch. Jacq. Poncel; Suite des Lettres Edifiantes, 4 Recueil, p. 363.

‡ Flora Sinensis, a P. Michaële Boym, p. 1; La Chine Illustrée, par d'Alquié, p. 258.

§ With regard to animals, the present inhabitants of Egypt know nothing of the hippopotamus.—*Shaw's Travels*. The

ern parts of Africa, from the Mediterranean to the river Bambou, which runs at the foot of Mount Atlas. Hence the climate inhabited by the hippopotamus extends only from Senegal to Æthiopia, and from thence to the Cape of Good Hope.

As most authors mention the hippopotamus under the names of the *sea-horse*, or the *sea-cow*, he has sometimes been confounded with the latter, which inhabits only the Northern Seas. It appears, therefore, to be certain, that the hippopotami, which the author of the Description of Muscovy says are found on the sea-shore near Petzora, are nothing else than sea-cows. Aldrovandus, therefore, merits reproach for adopting this opinion without examination, and maintaining that the hippopotamus is found in the North Seas*; for he not only does not in-

hippopotamus is produced in Æthiopia . . . descends by the Nile into Upper Egypt . . . desolates the fields by devouring the grain, and particularly the Turkish wheat. . . He is very rare in Lower Egypt.—*Descript. de l'Egypte, sur le Mem de M. de Maillet, par M. l'Abbé Mascrier*, tom ii. p. 126.

* Sed quod magis mirandum est, in mari quoque versari scripsit *Plinius*, qui agens de animalibus aquaticis, communis animi, terræ, et mari *crocodilos* et *hippopotamos* prædica-
bat. Idcirco non debemus admiratione capi, quando legitur in descriptione *Moscoviæ*, in *oceano adjacenti regionibus Petzoræ*, *equos marinos crecere*. Pariter Odoardus-Barbosa, Portugensis, in Cefala observavit multos equos marinos, a mari ad præta exire, denuoque ad mare reverti. Idem repetit *Edoardus-Vuot*, de hujusmodi feris in mari Indico errantibus. Propterea habetur in primo volumine navigationum, multos

habit the North Seas, but it appears that he is rarely found in the South Seas. The testimonies of Odoardus-Barbosa and Edward Wotton, quoted by Aldrovandus, and which seem to prove that the hippopotamus inhabits the Indian seas, are nearly as equivocal as that of the describer of Muscovy; and I am inclined to think, with M. Adanson *, that, now at least, the hippopotamus is found only in the great rivers of Africa †. Kolbe †, who says he saw several of

quandoque nauceros in terram descendere, ut hippopotamos in vicinis præter pascentis comprehendant; sed ipsi ad mare fugientes eorum cymbas aggrediuntur, dentibus illas disrumpendo et submergendo, et tamen bestiæ lanceis, ob cutis duritiem, sauciari minime poterant. — *Aldrov. de Quad. Digit. Vivip.* p. 181 et seq.

* In going up the Niger, we came to a quarter where the hippopotami or river-horses are very common. This animal, which is the largest of the amphibious kind, is found only in the rivers of Africa, and in no other part of the world. He is generally said to be of the figure of an ox; and, indeed, he resembles that animal more than any other. But his legs are shorter, and his head is enormously large. With regard to size, the hippopotamus may be ranked after the elephant and rhinoceros. His jaws are armed with four tusks, by which he tears up the roots of trees, which serve him for food. He cannot remain long under water without respiring, which obliges him to raise his head, from time to time, above the surface, like the crocodile. — *Voyage au Senegal, par M. Adanson*, p. 73.

† If the epithet *sea* be applied to the hippopotamus or *sea horse*, it is not because he is a species of fish, or lives always in the sea. He comes upon the dry land in quest of food, and he retires for safety to the sea or to a river. Herbage is his ordinary food. When pressed with hunger, he comes out of the water, in which he lies always in an extended posturo.

them at the Cape of Good Hope, assures us, that they plunge equally into the sea and the rivers; and the same thing is advanced by other authors.

When he raises his head above the water, he looks about on all sides to see if there is any danger, and he scent^s a man at a considerable distance. If he perceives any thing, he plunges again into the water, where he continues three hours without moving. . . . He generally weighs from 2,500 to 3,000 pounds. . . . The sea-horse, both in colour and size, resembles the rhinoceros, only his legs are somewhat shorter. His head, as Tellez remarks (lib. 1, cap. 8), has a greater resemblance to that of the horse, than to that of any other animal; and, from this circumstance, he has derived his name. His mouth is much larger than that of the horse, and, in this respect, he approaches nearer the ox. His nostrils are very large; and, when he rises to the surface of the river or sea, he squirts the water out of them. His ears and eyes are remarkably small. His legs are short, and of an equal thickness throughout. His hoofs are not divided into two, like those of the ox, but into four parts, on each of which there are spiral furrows. His tail is short, like that of the elephant, with a few short hairs on it; and there is no hair on the rest of the body.

The paps of the female hang like those of the cow, between the hind-legs; but they, as well as the teats, are very small in proportion to the size of the animal. I have often seen the mothers suckling their young, which were then as large as sheep. . . . The skin of the river-horse is more than an inch thick, and so hard, that it is difficult to kill him even with musket balls. The Europeans always aim at his head, where the skin is most tender, and easily pierced. This animal seldom receives a mortal wound in any other part of his body.

The teeth of the under jaw are very remarkable. They are four in number, two on each side, one of them crooked and the other straight. They are as thick as an ox's horn, about a foot and a half long, and each of them weighs twelve

Though Kolbe is more exact than usual in his description of this animal, yet it is doubtful whether he saw it so frequently as he insinuates; for the figure he gives is still worse than those of Columna, Aldrovandus, and Prosper Alpinus, which were all drawn from stuffed skins. It is easy to perceive, that the descriptions and figures in Kolbe's works have not been taken on the spot, nor drawn from Nature. His descriptions are written from memory, and most of the figures have been copied from those of other naturalists. The figure he has given of the hippopotamus has a great resemblance to the cheropotamus of Prosper Alpinus*.

Hence Kolbe, when he tells us that the hippopotamus inhabits the sea, has perhaps copied Pliny instead of giving his own observations. Most authors relate that this animal is only found in fresh water lakes, and in rivers, sometimes near their mouths, but oftener at great

pounds. They are very white, and never turn yellow with age, as ivory does. Hence they are more esteemed than the teeth of the elephant.

The flesh of this animal, whether boiled or roasted, is most delicious. It is so highly valued at the Cape, as to sell at twelve or fifteen pence the pound. The fat sells as dear as the flesh; it is very mild and wholesome, and used instead of butter, &c.—*Descript. du Cap de Bonne Esperance, par Kolbe* tom. iii. c. 3.

* Note, The figures of the cheropotami of Prosper Alpinus, lib. iv. cap. xii. tab. 22, seem to have been drawn from stuffed skins of hippopotami, from which the teeth appear to have been extracted.

distances from the sea. Some travellers are astonished that the hippopotamus should have been called the *sea-horse*; because, as Merollo remarks *, this animal cannot endure salt water. He generally remains in the water during the day, and comes out in the night to pasture. The male and female seldom separate. Zerenghi caught a male and a female the same day, and in the same ditch. The Dutch voyagers tell us, that the female brings forth three or four young at a time. But this fact is rendered suspicious by the very evidence which Zerenghi quotes. Besides, as the hippopotamus is of an enormous size, like the elephant, the rhinoceros, the whale, and all other large animals, it must produce but one at a time: this analogy seems to be more certain than the vague reports of travellers.

M. le chevalier Bruce assured me, that, in his travels through Africa, he saw a number of hippopotami in Lake Tzana, which is situated in Upper Abyssinia, near the true sources of the Nile; and that, in this lake, which is at least six leagues long by ten or twelve broad, the hippopotami are more numerous than in any other part of the world. He adds, that he saw some of them which were twenty feet long, with very thick, short legs.

* Hist. Gen. des Voyages, tom. v. p. 25.

Addition to the Article Hippopotamus, by Professor Allamand, Editor of the Dutch Edition of this Work.

To complete the description of the adult hippopotamus given by M. de Buffon, nothing is wanting but a genuine figure of the animal. M. de Buffon, who is always original, chose not to copy the figures published by different authors. They are all too imperfect to be used; and, with regard to the animal itself, he could not possibly procure it. Even in its native country, it is very rare, and too large to be transmitted without great expense and trouble. In the cabinet of natural curiosities in the university of Leyden, there is a stuffed skin of the hippopotamus, which had been sent from the Cape of Good Hope. Though it had been transported to Holland more than a century ago, it has been so well preserved, that it still exhibits an exact representation of the animal. It is supported by rings of iron, and by pieces of wood of such solidity, that drying has produced no considerable alterations. As it is probably the only specimen of the kind in Europe, I am persuaded that all lovers of natural knowledge will thank me for enriching the magnificent work of M. de Buffon with an exact engraving of it. The figure I have given represents the animal better than any that has hitherto been drawn,

or, rather, it is the only figure we have of it; for, in all the others, the hippopotamus is not distinguishable, if we except that to be found in a Dutch book, concerning the Leviathan of Holy Writ, which was copied from the same model; but the proportions of the animal are not accurately observed.

It is unnecessary to add a description of this enormous animal, having no additions to what has been said of it by M. de Buffon and M. Daubenton.

[As the figure of the young hippopotamus in the cabinet of the prince of Conde differs from that which M. Allamand had engraved from the stuffed skin in the Leyden cabinet, and as it has a greater resemblance to a new figure given by Dr. Klockner from another skin in the prince of Orange's cabinet, I have here preferred the latter; and I shall add some remarks of the same author, which were translated from the Dutch.]

Addition to M. de Buffon's History of the Hippopotamus, by Dr. Klockner of Amsterdam.

I am surprised that M. de Buffon takes no notice of a passage in Diodorus Siculus, concerning the hippopotamus, especially as this ancient author remarks, that its voice resembled the neighing of a horse, which perhaps induced him to give it the denomination of *hippopotamus*, or *river-horse*. M. de Buffon founded his opinion

of this matter upon the testimonies of ancient and modern authors. Diodorus Siculus ought to have held the first rank among the former, since he not only travelled into Egypt, but is justly esteemed to be one of the best historians of antiquity. The following are the words of the passage alluded to: "The Nile produces several animals, of which the crocodile and hippopotamus merit particular attention. . . . The latter is five cubits in length. His feet are cloven, like those of the ruminating animals; and in each jaw he has three tusks, larger than those of the wild boar. The whole mass of his body resembles that of the elephant. His skin is harder and stronger than, perhaps, that of any other animal. He is amphibious, and remains, during the day, under the water, where he moves and acts in the same manner as if he were on land, which he visits in the night, in order to feed on the herbage of the mountains. If this animal were more prolific, he would commit great devastation in the cultivated fields of Egypt. The hunting of the hippopotamus requires a number of men, who endeavour to pierce him with iron daggers. They attack him with several boats joined together, and strike with crooked harpoons. To some of these hooks they fix a rope, and then leave the animal to exhaust himself with struggling and the loss of blood. His flesh is very hard, and of difficult digestion *."

*Diodor. Sicul. lib i. p. 42, edit. Weselingii.

This is perhaps the best description of the hippopotamus to be found among the ancients; for Diodorus commits not a single error, but with regard to the number of the animal's toes.

Observations on the Mode of preparing the Skin of the Hippopotamus, now in the Prince of Orange's Cabinet, by Dr. Klockner.

I received from the Hague, in a very dry state, the skin of this hippopotamus, with the head inclosed within it. The skin had been first salted, then dried, and afterwards the skin of a young hippopotamus (which is likewise in the prince's cabinet) steeped in brine, was, in a moist state, put into the adult skin. After which, the whole was packed up in coarse cloth, and transmitted from the Cape of Good Hope to Holland. The small skin and the head, of course, produced a disagreeable odour of rancid grease, which attracted the insects, and they damaged the large skin that was first exposed to their attacks.

When I diluted the head, it swelled greatly. The opening of the mouth was more than sixteen inches of Amsterdam measure*. The upper and under lips were sufficiently large to cover all the animal's teeth, especially as the infe-

* The Amsterdam foot is only ten inches five lines of the French foot.

rior canine teeth are crooked, and slip along the curvature of the superior, in the form of scissors, and pass into a socket formed by the skin of the lip and the gums. Between the cutting teeth and the cylindrical grinders, as well as between the tongue and cutting teeth, there is a smooth hard skin; and the palate is full of notches or hollows. The tongue had been cut out. . . . The flesh on each side of the head had also been removed; and the fat which remained was corrupted. The whole, however, was interspersed with very strong muscles, and the flesh about the two lips was red and white, or of the colour of an ox's tongue.

Immediately behind the inferior canine teeth, there is a protuberance, which, when the mouth is shut, fills the space between the canine teeth and grinders. This opening, though filled, has contracted one half in drying, as well as the lips.

Under the ears, and around the auditory passage, which is remarkably small, as well as in the orbits of the eyes, there was a great quantity of fat.

The ears are placed upon an eminence, and in such a manner as to form circular folds. The elevation of the right ear was much diminished in drying; but it was conspicuous on the left.

We know that the ears of the hippopotamus are very small. But those of our subject had been considerably diminished by insects. The internal part of the ears is garnished with fine

close hair; but there is a very little hair on the outside.

The eyes must have been very small; for the sockets were uncommonly small in proportion to the magnitude of the animal. The eyes I placed in my subject are perhaps larger than nature; but, when I used smaller ones, they did not seem to correspond with the animal.

The nostrils slope downward, and have a small aperture. They are afterwards joined internally by a small crooked line. When the skin was dry, it was difficult to perceive these tubes. I enlarged them a little before the skin was again dried.

I must here remark, that I only found thirty-two teeth in this hippopotamus, which accords not either with Zerenghi's or M. Daubenton's descriptions. The first says, that he found forty-four teeth in his subjects; and the second found thirty-six in the head preserved in the Royal Cabinet. This difference excited my attention: but I could perceive no marks of teeth having fallen out, except one of the cutting teeth, which seemed to have been broken. There are four canine teeth placed perpendicularly, eight cutting teeth, four in the upper jaw, which are perpendicular, and four in the under jaw, placed horizontally, as may be seen in the figure. Besides, I found two grinders in each side of the under jaw, and three teeth, placed before the grinders, which had the form of kayles. In each side of the upper jaw, were three grinders, and two of these cylindrical teeth. Between these

cylindrical teeth, there is a space of about half an inch.

[I must here remark, says the count de Buffon, that the hippopotamus has commonly thirty-six teeth, namely, four cutting teeth above, and four below, and two canine teeth and twelve grinders in each jaw. This observation has been verified by three heads, which have long remained in the Royal Cabinet, and by a fourth head, which was transmitted to me in the month of December, 1775, by M. de Sartine, secretary of state to the marine department. The last grinder, at the bottom of the mouth, is much thicker, broader, and flatter on the edge, than the other five. But I am inclined to think that the number of grinders varies according to the age of the animal; and that, instead of twenty-four, we may sometimes find twenty-eight, and even thirty-two, which, as Zerenghi remarks, would make forty-four in all.]

The upper and under lips, continues Dr. Klockner, are garnished, at considerable distances, with small tufts of hair, which, like pencils, proceed from one tube. I counted about twenty of them. I examined a section of one of these tubes with the microscope, and found seven roots issuing from one tube. These seven roots afterwards split, and each gave rise to several hairs, which formed a kind of pencil.

On the sides of the mouth, toward the lower part, I saw some fine hairs, which were placed nearer each other than the former.

Besides, I found here and there upon the body

some scattered hairs; but there were none upon the legs, flanks, or belly.

The extremity and edges of the tail were garnished with pencils of hair, like the nose; but they were a little longer.

I could not discover the sex of this animal. Near the fundament there was a kind of triangular pinked aperture, about six inches wide, where I imagined the organs of generation had been situated; but, as no vestige of them remained, it was impossible to ascertain the sex.

The skin of the belly, near the hind-legs, was an inch and nine lines thick: here the insects had made a hole, which rendered it an easy matter to measure the thickness. The substance of the skin was white, cartilaginous, and coriaceous; and, at this place, it was well separated from the fat and flesh. Higher up, toward the back, a good deal of the skin had been pared off, with a view, no doubt, to render it lighter for carriage. It was for this reason that the skin about the spine exceeded not an inch in thickness.

The toes were furnished with nails. The skin between the toes was very wide; and I believe that the feet of this animal, when alive, were rather flat than round. The heel, which is placed high and backward, appeared to be well adapted for swimming. The hoof, though thick and hardened, was nevertheless flexible.

The dimensions of this animal were nearly the

same with those of Zerenghi's female hippopotamus, formerly described.

I was told, that this hippopotamus had advanced a great way upon land in the territories of the Cape, and even near the place called the *Mountains of Snow*, when it was shot by Charles Marais, a peasant of French extraction. This peasant brought the skin to M. de Piettenberg, governor of the Cape, who transmitted it to his highness the prince. I had the relation from a nephew of C. Marais, who resides in Amsterdam. According to the account given by this man, who had it from the mouth of Marais; the hippopotamus runs extremely swift, both in marshy places and on the firm ground. It is for this reason that the peasants, though excellent hunters, dare not fire upon him but when he is in the water. They lie in wait for him about sun-set, when the animal raises his head above the water, and keeps his small ears in perpetual agitation, in order to hear if any noise is near. When any object of prey appears upon the water, he darts upon it like an arrow from a bow. While the hippopotamus is listening in this manner, and floating on the surface of the water, the hunters endeavour to shoot him in the head. The one whose skin I stuffed was shot between the eye and the right ear; and the young one, which is also in the prince's cabinet, had been shot, or struck with an harpoon, in the breast, as appears from inspection. When he feels that he is wounded, he plunges below the

water, and walks or swims till he loses both motion and life. Then, by means of about twenty oxen, he is dragged on shore and dissected. An adult hippopotamus generally yields about two thousand pounds of fat, which is salted and sent to the Cape, where it sells very dear. This fat or lard is extremely good, and in relish excels all others. When pressed, it yields a mild oil, as white as cream. In Africa, it is recommended as a sovereign remedy for diseases of the breast. The quantity of lard derived from an individual demonstrates that this animal is of a surprising weight and magnitude.

Before finishing my remark, I shall here add some particulars, regarding the natural history of the hippopotamus, which are not to be found in the preceding description.

We have seen, that the hippopotamus probably derived his name from the resemblance of his voice to the neighing of a horse. From the most authentic accounts, however, it appears that his cry has a greater similarity to that of the elephant, or to the stammering and indistinct sounds uttered by deaf persons. Beside this cry, the hippopotamus, when asleep, makes a kind of snorting noise, which betrays him at a distance. To prevent the danger arising from this circumstance, he generally lies among the reeds that grow upon marshy grounds, and which it is difficult to approach.

I can no where find the remark of Marais, concerning the agility of this animal, confirmed.

We are perpetually assured, on the contrary, that the hunters choose rather to attack him on land than in the water, which indicates, that they are not afraid of his swiftness. According to other historians, his return to the river is cut off by trees and ditches; because they know that he uniformly inclines to regain the water, where he has no other animal to fear, rather than to fight or fly upon land. The great shark and the crocodile avoid the hippopotamus, and dare not engage with him.

The skin of the hippopotamus is so extremely hard on the back, the crupper, and the external parts of the thighs and buttocks, that neither arrows nor musket balls can pierce it. But it is softer and thinner on the inside of the thighs and belly, where the hunters endeavour to shoot him, or to pierce him with a javelin. He is extremely tenacious of life; and, therefore, they try to break his legs by large blunderbusses, charged with iron wedges. When they succeed, they are full masters of the animal. The Negroes, who attack the sharks and crocodiles with long knives and javelins, are afraid of the hippopotamus, and would perhaps never attempt to combat him, unless they knew that they could outrun him. They believe, however, that this animal has a stronger antipathy to the Whites than to the Blacks.

The female brings forth on land, where she suckles her young, and soon teaches it to take refuge in the water, when the smallest noise is heard.

The Negroes of Angola, Congo, Elmina, and, in general, of the whole west coast of Africa, regard the hippopotamus as one of those inferior divinities which they call *Fetiches*. They scruple not, however, to eat his flesh, when they can procure it.

I am uncertain whether I should here quote a passage from P. Labat, where he says that the hippopotamus, who is of a very sanguiferous temperament, knows how to let blood of himself. For this purpose, he remarks, the animal searches for a sharp-pointed rock, and rubs himself against it; till he makes a sufficient aperture for the blood to flow. To promote the flux, he agitates his body; and, when he thinks he has lost a sufficient quantity, he rolls in the mud in order to shut up the wound. In this story there is nothing impossible; but how could P. Labat discover such a singular operation?

Beside the uses to which the skin and teeth of the hippopotamus are applied, we are assured that the Indian painters employ the blood of this animal as one of their colours.

After these sheets were printed, I received some recent observations on this animal from M. Schneider, which have been re-digested by professor Allamand, and published at Amsterdam

the beginning of this year, 1781. The following is an extract from these observations :

What M. de Buffon has said of the hippopotamus, was the most exact account that could be drawn up at the time when he wrote that article. It then appeared to me that nothing was wanting but a better figure than preceding authors had given. I took the liberty of adding one to the description of M. de Buffon, done from a stuffed skin, which has been in the Leyden collection for more than a century.

Two years after I gave a better: a skin recently sent to the cabinet of the prince of Orange, served me for the model; it had been very carefully prepared by Dr. Klockner. I accompanied it with some interesting remarks, which had been communicated to me by captain.

ent to give a good the animal, when the same Mr. Gordon, ing of this year, 1780, sent me two presenting a male and female hippo- after the animals themselves, were killed. I was struck on figures that I had given, and saw clearly that the skin of so large an animal, although prepared and set up with all possible care, was far it- ng its original. accordingly, I did not hesitate to compare the two drawings, been in plates 243 and 244.

Mr. Gordon also had the goodness to add the



HIPPOPOTAMUS, *Male*



• HIPPOPOTAMUS, *female*.

descriptions, and the very curious novel observations, which he frequently had occasion to make. His indefatigable zeal for new discoveries and the advancement of natural history, engaged him to penetrate much farther into the interior of Africa, than had hitherto been accomplished. If the hippopotami are become rare in the neighbourhood of the Cape of Good Hope, they are found in abundance in their haunts. This cannot be doubted, when we learn that, on his part, he killed nine; and that in a chase, in which he was assisted by M. Plettenberg, governor of the Cape, they killed twenty-one, in a few hours, and that if it had not been for his intercession, the carnage would have been much greater. This chase was on the river called Plattenberg, about seven degrees of longitude, east from the Cape, and thirty degrees of southern latitude.

The number of these animals ought then to be very great in all the interior of Africa, where they are not disturbed by the inhabitants. It is there that we must study their habits, and no one has had a finer opportunity than Mr. Gordon; he has availed himself of it accordingly, and has observed with the eyes of a true naturalist.

When the hippopotami leave the water, the upper part of their bodies is of a bluish brown, becoming lighter as it descends the sides, and terminating in a light tint of flesh colour; the belly is whitish, but these different colours become every where deeper, when their skin

is dry. In the inside and on the edge of the ears, there are some softish hairs of a reddish brown; the eyebrows are also of the same colour, and some are scattered here and there upon the body, especially on the neck and sides, but they are shorter, and very harsh.

The males are always larger than the females, but not by a third, as Zerenghi has said, if we except the canine and cutting teeth, which in the female, may, in effect, be a third smaller than in the male. Mr. Gordon killed a female eleven feet long, and the largest male hippopotamus which he killed was eleven feet eight inches nine lines. These dimensions differ greatly from those given by Zerenghi, for, to judge by the measures of the female which he described, the male (one third larger) ought to be sixteen feet nine inches long. They differ still more from the hippopotami of the lake Tzana, of which some, according to Bruce, are more than twenty feet in length. Animals of this last size must be enormous, but we may be easily deceived in the size of an animal, when we merely judge by seeing it at a distance, without being able to obtain its measure.

I have said before, continues M. Allamand, that it appeared very doubtful to me, if the hippopotami fed on fish; I can now say it is almost certain that they do not. In the stomachs of thirty of these animals, which Mr. Gordon caused to be opened in his presence, he found only grass, without any remains of fish. I have also said that it does not appear

that they enter the sea: the reader may find the reasons I had for thinking so, in the passage quoted, and M. de Buffon appears to have been of the same opinion. The new observations of Mr. Gordon have undeceived me. He killed a hippopotamus at the mouth of the river Gambia, where the water was salt: he has seen them in the bay of St. Helena, and he has seen others go out to sea, two leagues from any river; in truth, they never go far from land, being prevented by the necessity of returning to take their food. They walk along the coasts from one river to another, which is sufficient to prove that they can live in salt water, and in some measure justify those (as well as Kolbe) who have given them the name of sea-horses, and who suppose that they live indifferently in the rivers and in the sea; probably those that inhabit the interior of the country, never go there; if the hippopotami that are near enter it, it is not to go far, on account of the reason which I have stated, and this same reason ought to induce them to prefer the rivers.

When they meet at the bottom of the water, they try to avoid each other; but, on land, it often happens that they fight in a terrible manner, so that we see but few without some broken teeth, or several cicatrices on the body, which marks are represented in the engraved figures. In fighting, they rise upon their hind feet, and it is in this attitude that they bite.

In those places where they are but seldom disturbed, they are not very timid; when they are approached, they will come to see what it is; but when once they become acquainted with the effects of fire-arms, they fly before mankind, trotting heavily like hogs; they will sometimes even gallop, but always heavily, yet a mare must walk very quick to be able to follow them. Mr. Gordon kept up with one for some time; but although he ran very fast, if the race had been longer, the hippopotamus would have gained ground.

Some travellers have said that the female hippopotami bear three or four little ones; analogy leads us to consider this point as very suspicious; observation proves it to be false. Mr. Gordon saw several pregnant females opened, and never found more than a single young one: he took one from the body of its mother, which he was so good as to send me. This foetus, which was almost completely formed, was three feet two inches long; the funis was studded with little buttons of a red colour. Its nails were soft and elastic: we could already feel the teeth, and the eyes had nearly acquired their form and full size. As soon as a young hippopotamus is born, its instinct directs it to the water, and sometimes it is carried on the back of its mother.

The flesh of the hippopotamus, as it has been said before, is well tasted and very wholesome: the foot and tail especially (when roasted), are

delicate bits. The country people are very fond of the fat, which swims at top, when they dress its lard. It is a remedy in much esteem at the Cape, though its qualities are over-rated*.

* We may conclude that the hippopotamus was formerly known in Siberia, since cast figures of the animal have been discovered in the ancient tombs of that country. Herodotus mentions the hippopotamus as a sacred animal in the district Papremis, but in no other part of Egypt. Bryant observes, "that the hippopotamus and crocodile were symbols of the same purport; both related to the deluge: and however the Greeks might sometimes represent them, they were both, in different places, revered by the ancient Egyptians*"

H.

* Ancient Mythology, iii. p. 264, Svo. edit.

END OF VOL. VII.

*Printed by C. Wood,
Poppin's Court, Fleet Street, London.*
